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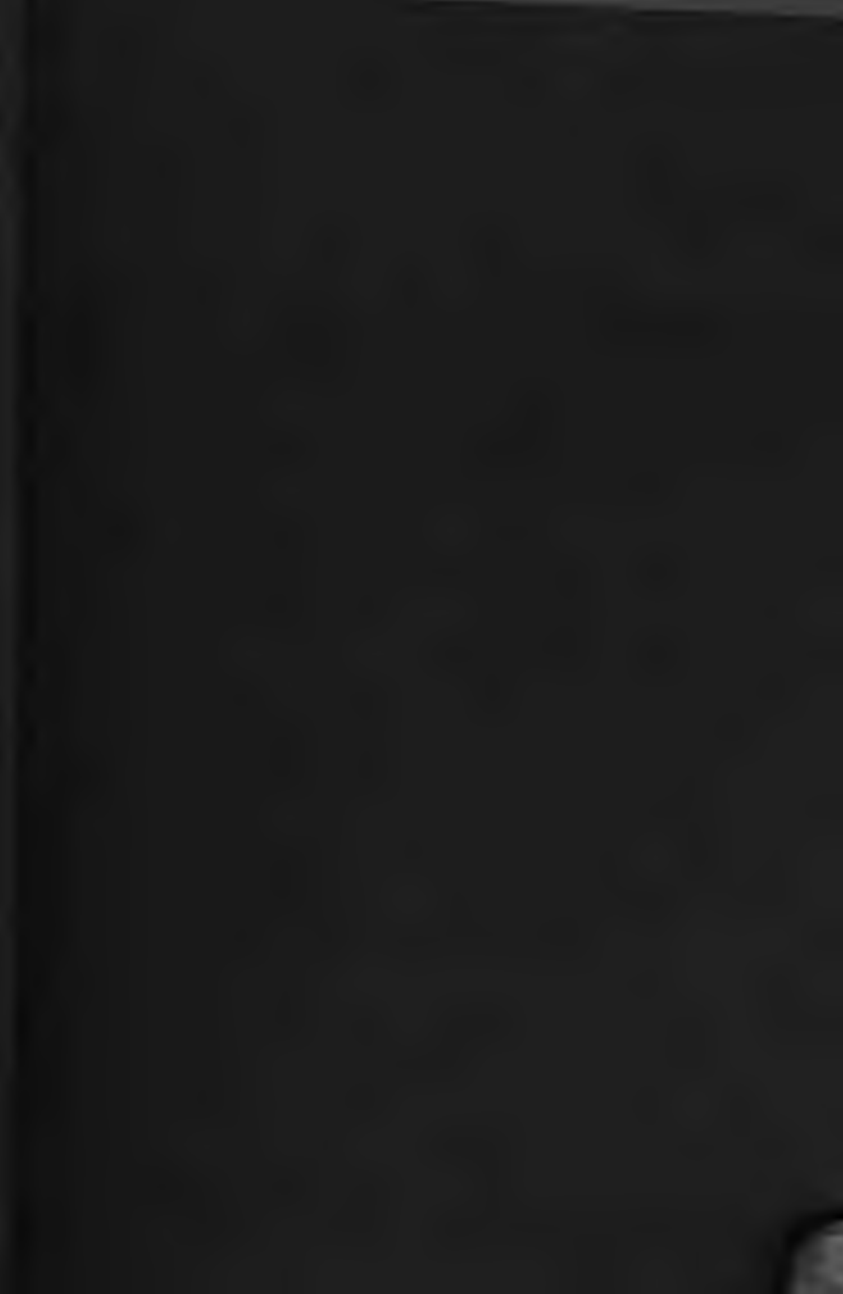
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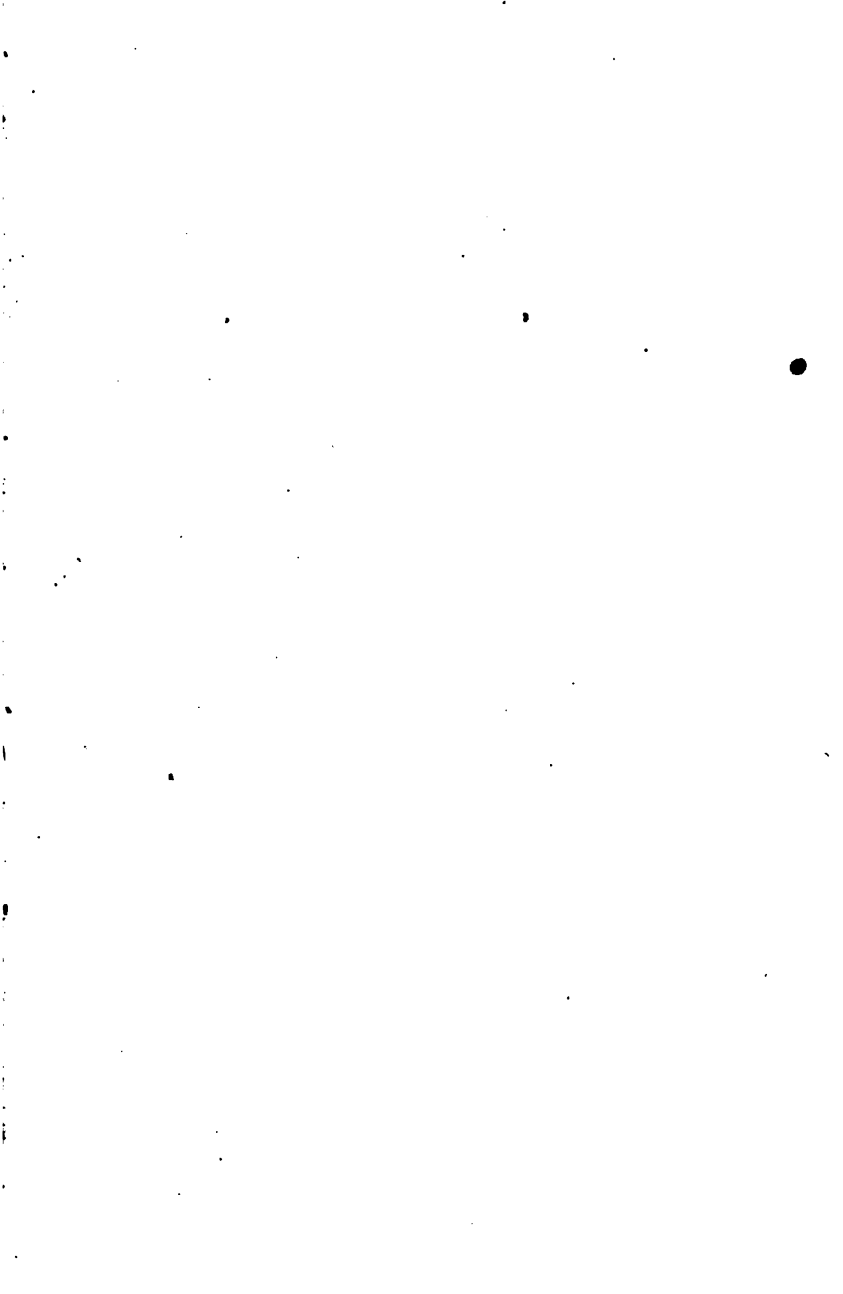


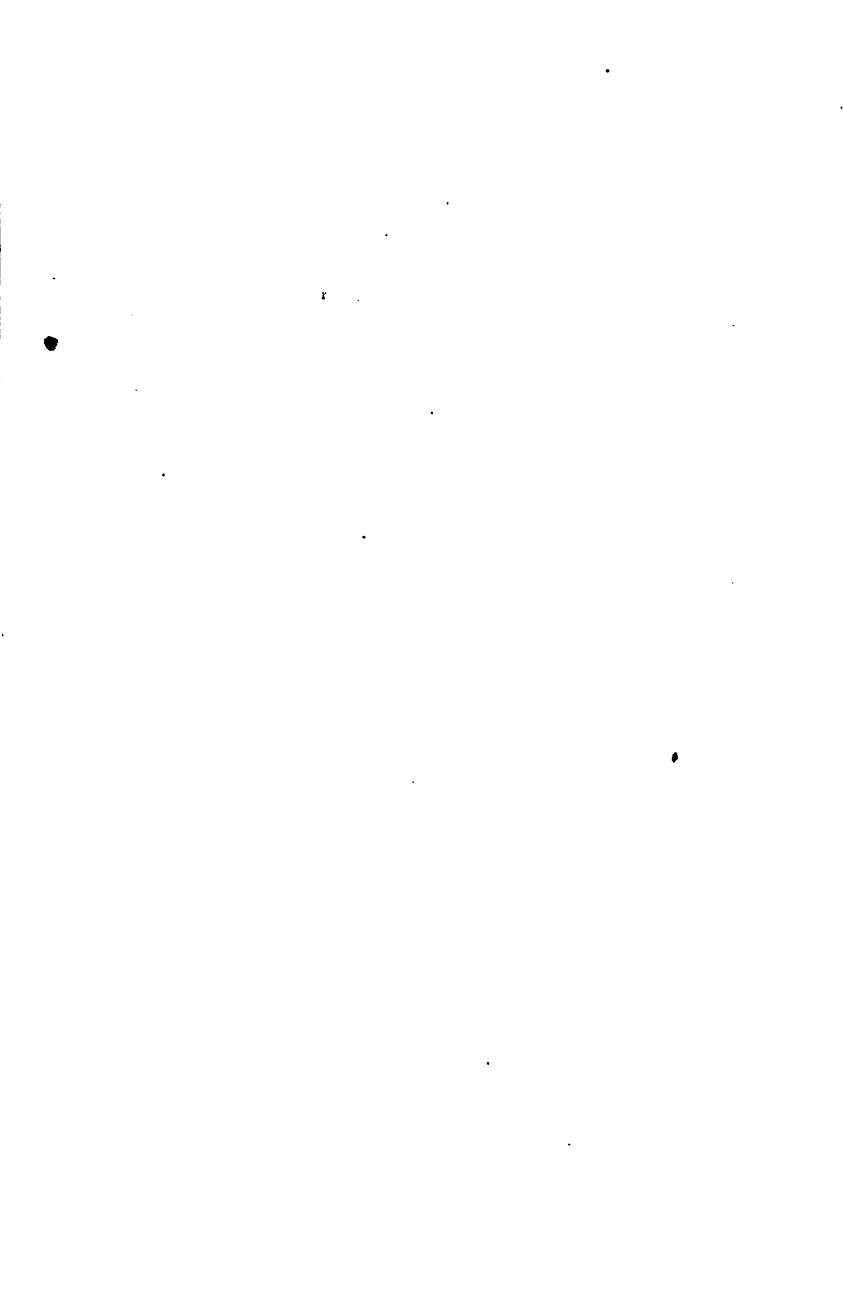
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STORIES OF INFINITY:

*LUMEN—HISTORY OF A COMET—
IN INFINITY.*

BY

CAMILLE FLAMMARION,

AUTHOR OF "THE ATMOSPHERE," "THE PLURALITY OF INHABITED
WORLDS," ETC., ETC.

TRANSLATED FROM THE FRENCH BY S. R. CROCKER.



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I. LUMEN.

FIRST STORY.—RESURRECTIO PRÆTERITI.

I.

INQUIRER. You promised, Lumen, to tell me the story of that strange hour — strangest of all hours — that followed the exhalation of your last sigh, and how, by the operation of a law, natural, though so wonderful, you saw again the past in the present, and penetrated a mystery that has been so profoundly insoluble until to-day.

LUMEN. Yes, my old friend, I will keep my promise; and, thanks to the long communion of our souls, I hope you will comprehend this phenomenon, “strange” as you call it. There are sights that the mortal eye can hardly endure. Death, which freed me from the feeble and fatigable faculties of the body, has not yet touched you with its liberating hand. You belong to the world of living creatures. Despite the seclusion of your retreat in these royal towers of the Faubourg Saint-Jacques, whither the profane come not to interrupt your meditations, you are yet a part of

earthly life and of its superficial preoccupations. Do not wonder, then, if, in admitting you to a knowledge of my mystery, I desire you to withdraw yourself still more strictly from external disturbances, and to give the greatest intensity of attention of which your mind is capable.

INQUIRER. I have ears only for hearing you, O Lumen, and intelligence only for trying to understand you. Speak, then, fearlessly and directly, and deign to describe the impressions, unknown to me, that follow the ceasing of life.

LUMEN. At what point shall I begin?

INQUIRER. If you remember from the moment when my trembling hand closed your eyes, I should like to take up the narrative at that point.

LUMEN. Ah, the divorce of the thinking and the nervous organizations leaves in the soul no kind of recollection. It is as if the impressions of the brain, which constitute the harmony of the memory, were utterly effaced, soon to be renewed in another mode. The first sensation of identity felt after death, resembles that of a dream on earth, when awakening gradually to a consciousness of the morning, we are yet penetrated by visions of the night. Importuned by the future and the past, the spirit tries at once to regain full control of itself, and to seize the fleeting impressions of the vanished dream, which still flit within it, with their retinue of pictures and events. Sometimes, wrapt in such retrospection of a delightful dream, it feels under its closed eyelid the links of its vision

reattaching themselves, and the spectacle continues ; it relapses at once into dreams, and a kind of half-sleep. Thus, as we leave this life, our thinking faculty is poised between a reality which it does not yet comprehend, and a dream not yet wholly vanished. Impressions the most diverse are intermingled and confounded, and if, under the burden of perishable sentiments, we regret the earth whence we have just been banished, we are also overwhelmed by a feeling of ineffable sadness which oppresses our thoughts, wraps us in shadows, and delays the coming of clear sight.

INQUIRER. Did you experience these sensations immediately after death?

LUMEN. After death? Death is not. What you call death, the separation of the body and the soul, does not, in fact, take place under a material form, as do the chemical separations of dissociated elements that are witnessed in the physical world. One is scarcely more conscious of this final severance, which seems to you so cruel, than is the new-born child of his birth. We are infants in heavenly life, just as we have been infants in earthly life. Only the soul, not being wrapped in the corporeal swaddling-bands which clothe it here below, acquires far more rapidly a knowledge of its condition and personality. This perceptive faculty varies greatly in different souls. There are some who, during life in the body, never lifted themselves toward heaven, never longed to master the laws of creation. Such, still under the dominion of bodily appetites, dwell a long time in a state of trouble and unconsciousness.

There are others, happily, who, at the close of this life, soar on winged aspirations to the summits of the sublime eternal; these behold with calm serenity the approach of the moment of separation; they know that progress is the law of existence, and that they will enter, beyond, into a higher life than this; they note, step by step, the numbness that mounts to their hearts, and when the last flutter, faint and imperceptible, ceases, they are already far above the body which they had seen sinking into sleep; and shaking off magnetic bonds, they feel themselves borne by an unknown force toward that point in the creation to which their aspirations, their feelings and their hopes have attracted them.

INQUIRER. This conversation just begun, my dear master, reminds me of Plato's dialogues on the immortality of the soul; and as Phædrus asked his master, Socrates, on the very day when the latter was going to take the hemlock, in obedience to the iniquitous sentence of the Athenians, I will ask you — you, who have passed the fatal bound — what essential difference distinguishes the soul from the body, since the one dies, while the other does not?

LUMEN. I will not give you a metaphysical answer, like that of Socrates, nor a dogmatic one, like that of the theologians, but a scientific answer; for you, like myself, value nothing except facts determined by positive methods. Now there are in man, as in the universe itself, three quite distinct principles: first, the body; second, the vital force; third, the soul.

I name them in this order that I may follow the method *à posteriori*. The body is an aggregation of molecules, themselves formed by groups of atoms. The atoms are inert, passive, unchangeable and indestructible. They enter into the organism by respiration and alimentation, constantly renew the tissues, are replaced by others, and, thrown off by life, go to make part of other bodies. In a few months the human body is wholly renewed: in the blood, in the skin, in the brain, and in the bones, there remains not a single one of those atoms which constituted the body a few months before. Through the vast medium of the atmosphere, especially, atoms travel incessantly from one body to another. The molecule of iron is the same, whether it is incorporated in the blood that pulses under the temple of an illustrious man, or is part of a bit of rusty scrap-iron. The molecule of oxygen is the same, whether it gleams in the amorous glance of a lover, or, combined with hydrogen, casts its flame into one of the thousand lights of the Parisian night, or falls in a drop of water from the bosom of the clouds. Bodies actually living are formed of the ashes of the dead, and if the dead should be resuscitated, some of the last comers would lack many fragments belonging to the first. And during life itself, many exchanges take place, between enemies as well as between friends; between men, animals, plants, which greatly astonish the eye of the analyzer. What you breathe, what you eat, what you drink, has already been breathed, eaten

and drunk thousands of times. Such is the body, — an assemblage of molecules constantly renewed.

Vital force, life, is the principle by which these molecules must be grouped in a certain form, and constitute an organism. Force dominates the passive atoms, — incapable of self-conduct, inert; it calls them, makes them come, takes them, places them, disposes them by rule, and forms this body, this marvel of organization, that the anatomist and the philosopher contemplate. Atoms are indestructible; vital force is not. Atoms have no age; vital force is born, grows old, dies. An octogenarian is older than a youth of twenty. Why? The atoms of which he is composed are in him only a few months at the most, and, besides, are neither old nor young. Analyzed, the constituent elements of the body have no age. What has grown old in him? It is his vital force, enfeebled, used up. Like heat and electricity, life is a force engendered by certain causes. It transmits itself by generation. It keeps the body alive instinctively and unconsciously. It has a beginning and an end. It is the vital principle, an unconscious physical force, which organizes and sustains the body.

The soul is an intellectual being, thinking, immaterial. The world of ideas, in which it lives, is not the world of matter. It has no age, and it does not grow old. It is not changed in a month or two, like the body; for after months, years, decades, we feel that we retain our identity, that our *ego* remains. Otherwise, if the soul did not exist, and the faculty of thought were a property of the brain, we could no longer say, *We*

have a body: it would be our body, our brain, *that would have us*. Moreover, from time to time our consciousness would change, we should no longer be sure, or even have a mere feeling of, our identity, and we should no longer be responsible for the resolutions secreted by the molecules which passed through our brain months before. The soul is not the vital force, for that is measurable, transmits itself by generation, has no consciousness of itself, is born, grows, declines, and dies, — conditions utterly opposed to those of the soul, which is immaterial, immeasurable, not transmissible, conscious. The development of the vital force may be represented geometrically by a spindle which swells insensibly as it whirls, to its middle, then diminishes to nothing. In the middle of life the soul does not reduce itself (if I may employ this comparison) by diminishing like a spindle and coming to an end, but continues to extend its parabola, darting into infinity. Besides, the soul's mode of existence is essentially different from that of life. It is a *spiritual* mode. The sentiment of justice or injustice, of the true or of the false, of the good or of the bad; study, mathematics, analysis, synthesis, contemplation, admiration, love, affection or hate, esteem or disesteem, — in a word, the occupations of the soul, whatever they may be, belong to an intellectual and moral order that neither atoms nor physical forces can know, and which exists as actually as the physical order.

We find in the entirety of the universe the three elements of the human person: first, the atoms, — the

mâterial worlds, inert, passive; second, the physical forces, active, which rule the worlds; third, God, the spirit eternal and infinite, the *intelligent* organizer of the *mathematical* laws which those forces obey,—the unknown God, in whom reside the supreme principles of the true, the beautiful, and the good.

The soul can be attached to the body only by the intermediary vital force. When life is extinct, the soul naturally separates itself from the organism, and ceases to have any immediate relation to space and time. It has no density, no weight. After death, the soul remains in that place in the heavens where the Earth is at the moment of the separation. You know that the Earth is a planet of the heavens as well as Venus and Jupiter. The Earth continues to traverse the length of its orbit at the rate of 26,800 leagues per hour, so that one hour after death the soul finds itself at that distance from its body, by the mere fact of its emancipation from the laws of matter, and its own immobility in space. Thus we are in the heavens immediately after our death, as, indeed, we have been the whole of our lives. Only we are freed from that weight which fixed us to the planet. I will add, too, that the soul is generally some time in disengaging itself entirely from the nervous organism, and that sometimes it remains several days, several months even, magnetically attached to its former body, which it is reluctant to abandon.

INQUIRER. For the first time I now conceive of, under an obvious form, this non-supernatural fact of

death, and comprehend the individual existence of the soul, its independence of the body, and of life, its personality, its survival, and its situation, so easily intelligible, in the heavens. This synthetic theory will prepare me, I hope, to understand and appreciate your recital.

A strange event astonished you, you said, at your entrance into eternal life. At what moment did it happen?

LUMEN. Listen, my friend: let me pursue my narrative. Midnight struck, you know, on my old clock, and the full moon in mid-heavens shed her pale beams on my dying bed, when my daughter, my grandson, and their friends withdrew to take some rest. You desired to remain by my pillow, and promised my daughter that you would not quit me till morning. I would thank you for your tender devotion, were we not old friends. We had been alone together half an hour, for the moon was declining to the right, when I took your hand, and announced that life had already deserted the extremities of my limbs. You insisted that I was mistaken; but I calmly observed my physiological condition, and I knew that but a few more breaths remained to me. You quietly turned toward my children's room; but, by a vigorous effort, I was able to call to you to stop. You returned with tears in your eyes, my friend, and said to me: "'Tis true; your last wishes have been communicated; and to-morrow morning there will still be time for seeing your children." There was a contradiction in these words

which I felt without seeming to feel it. You remember that I then begged you to open the window. What a lovely October night, more beautiful than that of the Scotch bards that Ossian sang of! Not far from the horizon, and before my eyes, shone out the Pleiades, dimly veiled by low-lying mists. A little beyond, Castor and Pollux soared victoriously in the heavens. And above, forming a starry triangle with these, there gleamed in the constellation Charioteer, a fair white star, which is known on the zodiacal charts as Capella, or the She-goat.

You see my memory does not fail me. When you opened the high window, the breath of the roses sleeping beneath the wing of night rose to me, mingling with the still radiance of the stars. To tell you how softly these impressions—the last that earth gave me, the last that my senses, not yet atrophied, were to taste—touched my soul, would be beyond my power of language. In my hours of tenderest poetical enthusiasm and sweetest bliss, I never felt the sublime joy, the glorious serenity, the heavenly exhilaration that were mine in those ecstatic minutes between the fragrant breath of the flowers and the tender glances of the far stars.

And when you came back to me, I had already turned toward the outer world, and, my hands clasped on my breast, I let my sight and my thought pray together, and soar into space. And as my ears were about to close forever, I remember the last words that fell from my lips: “Adieu, my old friend; I feel that

death is taking me . . . towards those unknown regions where we shall some day meet again. When the dawn has effaced the stars, only a slough will be left here. Say to my daughter that the last wish I expressed was that she should bring up her children in the contemplation of eternal good."

And as you wept, and remained on your knees at my bedside, I added: "Repeat the beautiful prayer of Jesus." And you began to say in a trembling voice, "Our Father" . . .

"Forgive us . . . our . . . trespasses . . . as we . . . forgive . . . those who . . . trespass against . . . us."

These were the last thoughts that reached my soul through my senses. My sight grew dim as I looked at the star Capella, and I knew nothing of what immediately followed this instant.

The years, the days and the hours are fixed by the movements of the Earth. Outside of these movements, terrestrial time has no existence in space: it is, therefore, impossible to have an idea of it. I believe, however, that the event of which I am going to tell you happened on the very day of my death. For, as you will presently see, my body was not yet buried when this vision came to my soul.

Born in 1793, I was in my seventy-second year, and was greatly surprised to find myself animated by an energy of spirit not less strong than possessed me in the heyday of my youth. I had no body; yet I was not incorporeal, for I felt and saw that a substance constituted me: nevertheless there was no likeness be-

tween it and the substances of which earthly bodies are composed. I know not how I traversed the celestial space, and by what force I was borne toward a magnificent white sun — whose splendor did not, however, dazzle me — surrounded, as it seemed to me at a distance, by a vast number of worlds, each enveloped in one or more rings. By this same unknown force I found myself carried toward one of these rings, a witness of unaccountable phenomena of light, for the starry expanse seemed to be, as it were, bridged by rainbows. I saw the white sun no more, and was in a kind of night tinted with many-colored clouds.

The sight of my soul was incomparably more keen than that of the earthly organism I had just quitted; and, wonderful as it may seem, its power seemed subject to the will. It is so marvellous that I will not stop here to describe it. Let me only tell you, that instead of merely seeing the stars in the heavens, as you see them from the Earth, I clearly distinguished the worlds that revolve around them; and another strange fact, when I wished to see a star no more, which hindered my inspection of these worlds, it disappeared from my sight, and left me the best possible opportunities of view. Moreover, when my gaze was fixed on a particular world, I could make out the details of its surface, the continents and seas, the clouds and rivers; and though it did not seem to grow preceptibly under my eyes, as when one looks through a telescope, I could, by a special concentration of my soul's vision, see the object on which it was concentrated, as, for ex-

ample, a city or a plain. And when I kept looking at this single point, minute features came out, and I saw buildings, streets, houses, trees, gardens and paths, as distinctly as if I were in a balloon, at a little elevation above them. At last, by the same process, and by means of my visual faculty, keeping my attention fixed always on the same object, I even distinguished the inhabitants, and followed people in the streets and into their houses. To do this, I had only to concentrate my thought upon the spot, the house, or the individual I wished to observe.

INQUIRER. But, my friend, (excuse my question, which may seem simple,) at that great distance are not the worlds, or the planets that revolve about each star, confused with the star itself? For example, at the distant point where you were, were not the planets of our system almost blent with our star, our sun? Could you distinguish the Earth?

LUMEN. You have hit, at first sight, upon the only geometric objection that seems to bear against the foregoing statement. In fact, at a certain distance, planets are absorbed into the light of their suns, and our earthly eyes can hardly distinguish them. You know that from Saturn the Earth can scarcely be identified. But it must be remembered that these difficulties are due as much to the imperfection of our sight as to the geometric law of the diminution of surfaces. Now in the world to the verge of which I had come, beings not clad in a fleshly envelope as here below, but free, and endowed with perceptive faculties of high power, can, as

I told you, *isolate* the illuminating source of the enlightened object, and therefore perceive distinctly details, which, at that distance, would be absolutely hidden from the eyes of earthly organisms.

INQUIRER. Do they employ, for this purpose, instruments superior to our telescopes?

LUMEN. If, in order to mitigate your incredulity as to this marvellous faculty, it is easier for you to imagine them equipped with instruments, you can do it theoretically. You may imagine glasses, which, by a series of lenses and an arrangement of diaphragms, bring near the several worlds, and isolate the illuminating focus so as to leave to the observer the single world which is the object of his study. But I must explain that these instruments are not external to these beings, but belong to the mechanism of their sight. It is well known that this optical construction and this visual power are natural in those worlds, not supernatural. Think of the insects that possess the power of contracting or lengthening their eyes like the tubes of a glass, of swelling or flattening their crystalline, in order to make a magnifying-glass of different powers, or, again, of concentrating upon the same focus a multitude of pointed eyes, as so many microscopes for seeing the infinitely little, and you can more intelligently concede the faculty of these ultra-terrestrial beings.

INQUIRER. Though not able to imagine it, since it is something quite outside of my experience, I can conceive this possibility. So you could see the earth,

and even distinguish from on high the cities and villages of our lower world?

LUMEN. Let me go on. I reached the ring mentioned just above, — a ring so enormous that two hundred earths like ours could revolve in it abreast; and found myself on a hill covered with palatial vegetation. At least it seemed to me that these fairy structures grew naturally, or were merely the result of an easy arrangement of branches and lofty flowers. It was a city of considerable size. On the summit of the hill where I landed, I saw a group of old men, twenty-five or thirty in number, who were looking, with fixed and anxious attention, upon a beautiful star of the southern constellation of Ara, on the confines of the Milky Way. They did not notice my arrival, so engrossed were they in observing this star, or a world of its system.

As for myself, I was profoundly astonished to hear them speak of the Earth, — yes, the Earth, in that universal language of the spirit, that all beings understand from Seraphim to the trees of the forest. And they spoke not only of the earth, but even of France. “Why these continual massacres?” they asked one another; “have they enacted a law of death, these creatures tainted with human blood? and what mean these scaffolds erected every morning, whence drop the heads of men and women, children and gray-beards? Is civil war going to decimate this people, to the very last of its defenders, and wash with waves of blood the streets of that capital just now so gay and so proudly adorned?”

I could make nothing of these words,—I, who had come from Earth with a speed more rapid than thought, and who, only yesterday, had, breathed in the bosom of a quiet and peaceful capital. I joined the group, and with them fixed my eyes on the beautiful star. Soon, hearing their conversation, and eagerly trying to see the extraordinary things of which they spoke, I saw at the left of the star a pale blue sphere: it was the Earth. You are aware, my friend, that despite the seeming paradox, the earth is really a star of the heavens, as I reminded you a minute ago. From a distance, from one of the stars that neighbor your system, this system appears to the spiritual eye like a family of stars composed of eight principal worlds ranged around the sun, become a star. Jupiter and Saturn first catch the eye by reason of their size; one soon sees Uranus and Neptune, then, near the Sun-star, Mars and the Earth. Venus it is not easy to perceive, and Mercury is invisible, by reason of its proximity to the sun. Such is the planetary system in the heavens.

My attention was exclusively directed to this little terrestrial sphere, by the side of which I recognized the moon. Soon I saw the white snow of the North Pole, the yellow triangle of Africa, the outlines of the ocean, and, as my gaze remained fixed on our planet, the Sun-star was soon eclipsed to me. Then, little by little, I could distinguish on the sphere amid azure spaces a sort of bistre “pinking,” and, maintaining my scrutiny, discovered a city in the midst of it. I had

no difficulty in recognizing this continental "pinking" as France, and the city as Paris. The first mark by which I knew the capital was the silvery ribbon of the Seine, which meanders so sinuously to the west of the great city. I recognized, too, the Isle of the City. The nave and towers of Notre Dame, as I saw them from on high, formed an exact Latin cross at the eastern end of the city; the boulevards stretched their girdle to the north. At the south I saw the garden of Luxembourg and the Observatory. The cupola of the Pantheon capped with gray the hill of St. Genevieve. At the west appeared the straight line of that grand avenue, the Champs Elysées; and beyond were the Bois de Boulogne, the environs of St. Cloud, the forest of Meudon, Sèvres, Ville d'Avray, and Montretout. This scene was illuminated by a brilliant sun, but — strange sight! — the hills were covered with snow, as in the month of January, while I had left the fields of October wholly green. I was already sure it was Paris I saw; but as I no longer understood the exclamations of my companions, I tried to make a still closer scrutiny.

My gaze rested preferably on the Observatory; it was my favorite district, and in forty years I had hardly quitted it for a month. Now imagine my surprise, when my vision having become used to the picture, I saw that there was no longer a street between the Luxembourg and the Observatory, and that the magnificent avenue of chestnuts had given place to little gardens. My artistic indignation was aroused by

these encroachments upon the edility of Paris, but was instantly superseded by more potent preoccupations. A convent slept in the beautiful plain of the orchard! There was no longer a Boulevard Saint Michel, nor a Street of Médicis; there was a huddle of little streets, and I seemed to recognize the old street de l'Est, the Place St. Michel, where formerly an antique fountain supplied water to the inhabitants of the Faubourg, and a series of little alleys that I used to see. The Observatory was shorn of its cupolas; the two lateral wings also had disappeared. Little by little, continuing my inspection, I saw that in detail, Paris was wonderfully changed. The Arc de Triomphe de l'Etoile was no more, nor a single one of the many avenues of which it was the end. There was no Boulevard de Sebastopol, nor the Eastern terminus, nor one of the other termini, nor any line of railway! The tower of St. Jacques was shut in by old houses, and the Column of Victory was close to it. The Column of the Bastille was also missing, for I should have recognized its beauty in the reflected sunlight. The Column Vendôme seemed to be replaced by an equestrian statue. The street Castiglione was an old green convent. The street of Rivoli had vanished. The Louvre was not finished, or was demolished. Between the Court of Francis I. and the Tuileries were visible heaps of ruins, with *débris* hanging from the roofs. On the Place de la Concorde, there was not a sign of an obelisk, but a swaying crowd that I had not seen at first; neither the Madeleine, nor the Rue Royale was to be seen. There was a little

island behind the Isle St. Louis. The exterior Boulevards were simply the ancient round walls, and the fortifications had closed up their cincture. In fine, while recognizing the capital of France by means of the buildings that remained, and some districts that had undergone no change, I knew not what to think of so marvellous a metamorphosis, that, between two days, had so thoroughly altered the looks of the old city.

The thought first occurred to me, that instead of occupying a very little time in coming from the earth, I had, no doubt, passed many years in the journey,—perhaps, even, many centuries. As the notion of time is essentially relative, and there is nothing real or absolute in the measure of duration, once separated from the globe, I had lost in the act all standards of measure, and I said to myself, that years and centuries must have passed by me without my knowledge—for my interest in my journey was so keen as to prevent the way from seeming long—a common phrase, which denotes the relativity of that feeling in our minds. Having no means of assuring myself as to the fact, I should no doubt have settled down in the belief that many centuries separated me from my life on earth, and that I was looking upon Paris of the twentieth or twenty-first century, if I had not still further prosecuted the inspection of my picture.

In fact, I satisfied myself by successive tests as to the appearance of the city, and gradually recognized places, streets, and buildings that I had known in my youth. The Hotel de Ville seemed to be decked with

flags, and the chateau of the Tuileries turned to me its square, central dome. A brief examination of details brought my scrutiny to an end, when, in the midst of the garden of an ancient convent on the street of Saint Jacques, I noticed a summer-house that made me start. There I had met, in my youth, the woman who loved me so tenderly ; my Eivlys (Sylvie), so gentle and so devoted, who gave up everything to join my fortunes. I saw the little cupola of the terrace, before which we loved to dream, of evenings, and study the stars. Oh, how joyfully I greeted those paths that we had trodden, walking, with equal step, those avenues in which we hid from the inquisitive glances of the suspicious public ! I gazed at this summer-house, which looked just as it used, and you will understand that this sight alone sufficed to complete my proofs, and to convince me, with an unshakable conviction, that far from beholding the Paris of *after my death*, as it was so natural to think it, I was gazing upon Paris *gone by*, — old Paris of the beginning of the present, or of the end of the last century.

You will readily understand, nevertheless, that despite this evidence, I could not believe my eyes. It seemed to me more reasonable to admit that Paris had so grown old, had undergone such transformations, since I left the Earth (an interval of whose duration I was absolutely ignorant), that I was looking at the city of the future, if I may express by this figure a fact which would have been present for me. I pursued, therefore, my careful inspection, to determine if it was, beyond

question, *old* Paris, partly demolished, that I was looking at, or if, by a phenomenon not less incredible, it was another Paris, another France, another Earth.

I I.

INQUIRER. What an extraordinary situation for your analytical mind, O Lumen! How could you possibly satisfy yourself as to the fact?

LUMEN. The old men of the hill had continued their conversation, while the foregoing reflections occupied my mind. Suddenly I heard the oldest one, a venerable person, whose Nestor-like head commanded at once admiration and respect, cry, with a voice of sorrowful resonance :

“On your knees, my brothers! Beg grace of the Universal God. This land, this nation, this city, are stained with a great crime: the head of an innocent King has just fallen!”

His companions seemed to understand, for they knelt on the hill, and humbled their white faces in the dust.

I—who had not yet been able to distinguish persons on the streets and public places, and had not followed the close observation of the old men—I stood erect, and strained my eyes with new intentness.

“Stranger,” said the sage to me, “do you disapprove

the action of your brethren, since you do not join your prayer with theirs?"

"Venerable sir," I answered, "I neither approve nor disapprove what I do not understand. Just arrived on this hill, I know not the cause of your imprecations."

Then I drew near to the old man, and, while his companions had risen, and were talking together in groups, I asked him to tell me what he saw.

He informed me, that by the intuition vouchsafed to those of the degree to which the inhabitants of that world belonged, and by that keen power of perception which is their common possession, they sustain a kind of magnetic relation with neighboring stars. Those stars are twelve or fifteen in number; they are very near together; beyond their neighborhood, perception becomes confused. Our sun is one of them. They know, then, vaguely, but intelligently, the condition of the human beings that live in the planets dependent on the sun, and their relative degree of intellectual or moral elevation.

Moreover, when some great perturbation agitates one of these humanities, either in their physical or moral order, they experience a kind of inward disturbance, just as we see a vibrating cord communicate its vibration to another, at a distance.

For a whole year (the year in this world is equal to ten of ours), they had felt a special interest in the terrestrial planet; and observers had followed with anxious interest the fortunes of this world. They had

witnessed the downfall of a kingdom, the dawn of resplendent liberty, the conquest of the rights of man, the declaration of the great principles of human dignity. Then they had seen these lights grow pale, passions freed from restraint, burst into deplorable excesses, the heavens obscured with clouds, and dire portents forebode the coming of the storm. I understood that the great revolution of '89 was referred to, and the fall of the ancient political world before the new. For some time, especially, they had sorrowfully noted the proceedings of the Terror, and the tyranny of the blood-drinkers. They apprehended the destruction of the earth, and were dubious as to the advancement of this emancipated humanity. Yet some of them expressed the hope that some superior man would rise to put a bit in the mouth of anarchy, to struggle, for a moment, against Liberty herself, to rule the world by might, and at last to suffer Liberty to resume the reins of her chariot.

I took care not to inform the venerable man that I, myself, had come from the Earth, and had lived there seventy-two years. I don't know whether he knew it intuitively, but I was so profoundly surprised by this vision, that my thoughts were wholly given up to it, to the utter exclusion of myself. My sight was at last assimilated to the observed spectacle, and in the middle of the *Placé de la Concorde*, I distinguished a scaffold, surrounded by a formidable military force. A wagon, driven by a man clothed in red, bore the remains of Louis XVI.; noble heads had just been severed, and

tumbrils laden with the quivering bodies moved through the Faubourg St. Honoré. A drunken populace shook their fists at heaven. Horsemen marched soberly, sabre in hand. Toward the Champs Elysées could be seen ditches, into which pedestrians fell. The ragged trees were leafless, seeming to be in mourning, rather than dead. The *sans-culottes*, climbing to their tops, brandished their caps, and in the remote streets hardly did infrequent passers dare penetrate those solitudes.

I had witnessed the events of '93, since that was the year of my birth, and with unspeakable interest I found myself an observer of that scene which historians have described. But, intense as was that interest, you will see that it was dominated by a sentiment still more powerful: *that of knowing that I was at the end of 1864, and seeing plain before me a deed done at the end of the last century.*

INQUIRER. I think, indeed, that this consideration of impossibility must have materially modified your contemplations; for, in fact, that was a vision which we know to be thoroughly illusory, and which we cannot admit to be real, even while we see it.

LUMEN. Yes, my friend, impossible. Now do you understand my situation, when I saw with my own eyes this paradox realized? It is a common saying, that sometimes "one cannot believe one's eyes"; that was just my case. Impossible to deny what I saw, impossible to admit it.

INQUIRER. But was it not a conception of your mind, a creation of your imagination, a shred of recollection?

Have you convinced yourself that it was a reality, and not a strange gleam of memory?

LUMEN. That is the first thought that entered my mind. But it was so evident that I was looking on Paris of '93, and the deed of January 21st, that I could no longer doubt it. And, moreover, this theory was overthrown in advance, by the fact that the old men had preceded me in the observation ; that they saw, analyzed, and informed each other of the action as something present, while wholly ignorant of the history of the earth, or of the fact that I knew that history. Besides, we had before our eyes *a present fact*, — not a past fact.

INQUIRER. But then, if the past can thus be blent with the present ; if reality and a vision can intermarry in this way ; if persons long since dead can still be seen moving before the eyes ; if the new structures and material alterations in a city like Paris can disappear and leave visible in their stead the city of by-gone days ; if, in fine, the present can be sacrificed for the resurrection of the past, what can we hereafter count upon as certain? What becomes of the science of observation? What becomes of deductions and theories? What is the foundation of our knowledge, that seems so solid? And if these things are true, must we not henceforth doubt everything or believe everything?

LUMEN. These considerations, and many others, my friend, have engrossed and troubled me ; but they do not invalidate the reality of what I saw. When I became certain that we had present before us the year 1793.

it instantly occurred to me that science itself, instead of combatting this reality (for two truths cannot be opposed to one another) must give me an explanation of it. I interrogated physics, and awaited its reply.

INQUIRER. What was it, — that the thing was real?

LUMEN. Not only real, but comprehensible and demonstrable. You shall have an astronomical explanation of it.

I first regarded the position of the Earth in the constellation of Ara, of which I have spoken. In orienting myself with reference to the polar star and the zodiac, I noticed that the constellations were not very different from those that are seen from the Earth, and that, some particular stars excepted, their position was evidently the same. Orion still ruled at the terrestrial ex-equator; the Great Bear, arrested in his circular course, still recalled the north. Recurring to the coördinates of apparent motions, hereafter suspended, I determined, then, that the point where I saw the group of the sun, the earth and the planets, must indicate the seventeenth hour of right ascension, that is, the 256th degree, or about that. (I had no instrument with which to take the exact measurement.) I observed, secondly, that this was about 44° from the South Pole. These calculations were for the purpose of discovering what star I was on. They brought me to the conclusion that I must be on a star situated near the 76° of right ascension, and near the 46° of north declination. I knew from another quarter, by the words of the old man, that the star on which we were was not very far from our

sun, since he reckoned it among the neighboring stars. Aided by these *data*, I could easily learn from my memory what star answered to the determined positions. Only one met the conditions; this was a star of the first magnitude, α , in Auriga, called also Capella, or the She-goat. There was not the least uncertainty as to this point.

So I was surely on a world that belonged to the system of this star. Hence, in fact, the sun performs the office of a simple star, which, at the end of its journey, will take up its place in perspective before and in the constellation of Ara, situated exactly opposite that of Auriga, when seen by an inhabitant of the Earth.

Then I tried to think what was the parallax of this star. I remembered that a friend of mine, a Russian astronomer, had calculated, and his calculation had been confirmed, that this parallax was $0''.046$. I rapidly approached the solution of the mystery, and my heart beat joyfully.

Every geometrigian knows that the parallax indicates mathematically the distance in units of the magnitude in question. I should thus remember exactly the distance of this star from the Earth, and even, if necessary, calculate it; for this purpose I needed only to ascertain what number corresponded to $0''.046$.*

* Every one knows that the more distant an object is, the smaller it appears. An object seen only under an angle of one second, is distant 206,265 times its size, whatever that may be; for there are 1,296,000 seconds in a circumference; the ratio of the circumference to the diameter is 3,14159, and

Stated in millions of leagues, this number is about 170,392,000. Therefore the distance of the star on which I was from the Earth was 170 trillions, 392 milliards of leagues.

The principle was determined, and the problem was three-parts solved. Now, look at this cardinal point, to which I beg your special attention, for on it hinges the explanation of the strangest of realities.

You know that light does not instantaneously compass the distance between two points, but gradually. You must have noticed that when a stone is thrown into a sheet of quiet water, a series of undulations results around the point where the stone falls. It is thus with sound in the air passing from point to point. It is so with light in space, which transmits itself gradually by successive undulations.

The light of a star occupies a certain time in passing to the Earth, and this time is of course proportioned to the distance which separates the two points.

Sound travels three hundred and forty metres per second. A cannon-shot is heard at the instant of explosion by the cannoneers who are near the piece; a second later, by those who are three hundred and forty metres away; three seconds later, by those distant one kilometre; twelve seconds later, at the distance of a league; two minutes later, at the distance of ten leagues,

$\frac{1,296,000}{3,14159 \times 2} = 206,265$. As the star Capella sees the demi-diameter of the Earth's orbit only under an angle twenty-two times smaller, its distance is twenty-two times greater; it is consequently 4,484,000 times the radius of the Earth's orbit.

and three minutes later, by those who, living twenty-five leagues away, hear the sound of this man's thunder.

Light is transmitted far more rapidly, but not instantaneously, as the ancients believed. It travels at the rate of seventy-seven thousand leagues per second; and if it could move in a circular direction, would compass the globe eight times in a second. It goes to the Earth from the moon, in one second and a quarter; from the sun in eight minutes, thirteen seconds; from Jupiter in fifty-two minutes; from Uranus in two hours, and from Neptune in three hours. We therefore see celestial bodies, not just as they are at the instant of observation, but as they were at the departure of the luminous ray that comes to us. If a volcano, for instance, burst into flame in the worlds I have just mentioned, we should not see the fiery display until one second and a quarter after the eructation, if the volcano were in the moon, fifty-two minutes after, if it were in Jupiter, two hours after, if it were in Uranus, and three hours after, if it were in Neptune.

Going beyond the planetary system, we find the distances incomparably greater, and the retardation of the light much longer. Thus it takes a luminous ray from the star nearest us, α of the Centaur, three years and eight months to reach us; the light of Sirius spends twenty-two years in bridging the gulf that separates us from that star.

Capella being situated at the above-stated distance from the Earth, it is easy to calculate at the rate of seventy-seven thousand leagues to the second, how much

time light requires to traverse this space. The calculation made, gives seventy-one years, eight months, and twenty-four days. The light proceeding from Capella to the Earth, reaches the latter only at the end of an uninterrupted journey of seventy-one years, eight months, and twenty-four days.

In like manner, light proceeding from the Earth to that star occupies the same time in its passage.

INQUIRER. If the luminous ray that comes to us from that star is nearly seventy-two years on the way, it brings us the light of the star as it was, almost seventy-two years previously, at the instant of its departure?

LUMEN. You are quite right. That is just the fact that it is important to bear in mind.

INQUIRER. So, in other words, the luminous ray is like a courier, who brings us news as to the condition of the country which despatches him, and who, if he is nearly seventy-two years on the road, reports the state of affairs at the time of his departure, that is, nearly seventy-two years before he reaches us?

LUMEN. You have divined the secret. Your comparison shows that you have lifted a corner of the veil. In more exact terms, the luminous ray would be a courier, who should bring us, not written despatches, but photographs, or more exactly still, *the very aspect of the country*, whence he comes. We see this aspect just as it was at the moment when the luminous rays that each one of its points sends to us, and by which it is made known to us,—at the moment, I say, when

these rays left it. Nothing is more simple, more indisputable. Thus, when we inspect with a telescope the surface of a star, we see that surface, not as it is at the moment of our observation, but as it was at the moment of emission of the light that comes to us from it.

INQUIRER. Hence, if a star whose light spends say ten years in coming to us, were suddenly annihilated to-day, we should continue to see it for ten years, because its last ray would not reach us until the end of that period?

LUMEN. Just so. In a word, the rays of light from the stars, not reaching us instantaneously, but occupying a certain time in traversing the intervening distance, show us these stars not as they are now, but as they were at the emission of the rays which bring us a representation of their aspect.

Here, then, is a surprising *transformation of the past into the present*. For the star observed, it is the past, the vanished; for the observer, it is the present, the actual. The star's past is strictly and positively the observer's present. As the aspect of the stars changes from year to year, from season to season, almost from day to day, one may imagine this aspect as fleeing into space, and hurrying into infinity, to reveal itself to the eyes of far distant searchers. Each aspect is succeeded by another, and this, in turn, by a third; there is, as it were, a series of undulations, which bear afar off the past of worlds, become present for observers stationed in ranks along its course; what

we think we see going on in the stars, is already past ; and what is really happening there, we do not see.

Familiarize yourself, my friend, with this representation of an actual fact, for it is important that you should imagine this successive progress of light, and comprehend, in its true character, this unquestionable truth: the aspect of things brought to us by light shows us these things not as they *are*, but as they *were*, according to the length of time occupied by the light in passing the space that divides us from them.

We do not see any of the stars as they are, but as they were when the arriving ray of light left them.

We see not the actual state of the heavens, but their past history. There are even certain stars that have had no existence for ten thousand years, which we yet see, because the ray that reaches us left them a long time before their destruction. A certain double star, whose character and movements you have painfully sought to determine, has never existed since there were astronomers on the earth. If the visible firmament were annihilated to-day, we should still see it to-morrow, and even next year, and even a hundred years, a thousand years, five thousand, and a hundred thousand years hence, and more, save only a few stars nearest to us, which would be successively extinguished as the time lapsed in which their rays made their journey to us: α , of the Centaur, would first go out, in three years and eight months ; Sirius, in twenty-two years, etc.

Now, my friend, you can easily apply scientific theory

to the explanation of the strange fact of which I was a witness. If from the earth one sees Capella not as she is at the moment of observation, but as she was seventy-two years before, similarly from Capella one can see the earth only with a retardation of seventy-two years. Light demands the same time for accomplishing the same transit.

INQUIRER. I have attentively followed your explanations. But is the earth brilliant, like a star, when viewed from a distance? Yet she is not luminous.

LUMEN. She reflects into space the light received from the sun. The greater the distance, the more she resembles a star, the whole volume of light shed by the sun upon a surface of three thousand leagues broad, being concentrated in a disk which grows smaller and smaller. Therefore, seen from the moon, she seems as bright as the full moon, and fourteen times as large. Seen from Venus, she is as bright as Jupiter seems to be on the earth. To Mars she is the morning and evening star, with phases such as Venus presents to us. Thus, though not luminous, she shines at a distance, like the moon, like the planets, by the light she receives from the sun, and which she reflects into space. Now, just as the events of Neptune have a retardation of three hours, as seen from the Earth, so those of the Earth have the same retardation seen from Neptune. Thus from Capella the Earth is seen, with seventy-two years' retardation.

INQUIRER. Strange and novel as these views are to me, I now clearly understand how, finding yourself in

Capella, you saw the earth, not as it was in October, 1864, the date of your death, but as it was in January, 1793, since light requires seventy-one years and eight months for the journey between the earth and that star. And I understand, quite as clearly, that this was neither a vision, nor a freak of memory, nor a marvellous or supernatural occurrence, but an actual fact, positive, natural, and incontestable; and that in fact what had happened long ago on the Earth was only a present event to an observer posted at that distance. But let me ask you one question, by the way. Since, going from the Earth, you were a witness of this fact, you must have spanned the distance from our world to Capella, with a speed greater than that of light itself.

LUMEN. I spoke of this very point when I told you that I thought I traversed that distance with the speed of thought, and on the very day of my death found myself within the system of this star,—the star that I admired and loved so much while I was on Earth.

INQUIRER. Ah, master, though all this be explained, this vision is none the less astonishing. Truly it is a very extraordinary phenomenon, this seeing *the past present*, seeing it only in this surprising manner, and finding it impossible to see the stars as they are at the moment one looks at them, but only as they were some time, longer or shorter, before.

LUMEN. The natural astonishment that you feel, my friend, in the contemplation of this truth, is only the prelude, I venture to say, to the amazement that is going to seize you. Undoubtedly it seems at first

thought very extraordinary that by going far enough into space one can really witness the events of past ages, and retrace the stream of time. But this is not the strange and positive marvel that I have to tell you about, and that will seem to you more fantastical still, if you care to listen a little longer to the story of the day after my death.

INQUIREE. Go on, I pray! I thirst for your revelation.

III.

LUMEN. Having turned my eyes from the bloody scenes in the Place de la Revolution, I was attracted toward an old house opposite Notre Dame, and occupying the spot where the parvise is now built. Before the bastard gate was a group of five persons. They were reclining on wooden benches, bareheaded notwithstanding the heat of the sun. As they rose and began to walk about, I recognized in one of them my father, looking younger than I had ever seen him, my mother, looking younger still, and one of my cousins, who died in the same year with my father, about forty years ago. It is difficult at first to recognize individuals, because one sees them from above, and as from a superior level, not face to face. I was very much surprised at this discovery; but I remembered then having heard in my

youth, that before my birth my parents lived in the Place Notre Dame.

More astonished than I can tell, I felt my eyes grow weary, and I ceased to distinguish anything, as if clouds had suddenly spread over Paris. I thought, for an instant, that a whirlwind had seized me. Moreover, as you know, I had no idea of time.

When I could see objects distinctly again, I saw a company of children running about in the Place de Pantheon. They seemed to be scholars coming from school, for they were laden with their books and portfolios, and were apparently going home, capering and gesticulating. Two of them specially attracted me, because they seemed to be quarrelling, and began to fight. A third ran up to separate them, but received a blow on the shoulder which bore him to the ground. At the same instant I saw a woman hasten to the child. It was my mother.

Ah, never, no never in my seventy-two years of earthly life, amid all the vicissitudes, the surprises, the unexpected shocks with which this life abounded, amid all its events, wonders and chances, I never felt such emotion as that which seized me when I recognized in the child, — *myself*.

INQUIRER. Yourself?

LUMEN. Myself! with my blonde six-year-old curls, my collar embroidered by the dear hands of my mother, who was running to my assistance, my little sky-blue blouse, and my always-rumpled ruffles. I was really there, — the very same child whose dim image you have

seen in the little miniature on the mantle-piece. My mother came, took me in her arms, while she scolded my comrades, then led me by the hand to the house, which then stood just at the entrance of Rue d'Ulm. Then I saw, that having passed through the house, we were in a garden with many other persons.

INQUIRER. Pardon me for one critical observation. I declare it seems impossible that one could see one's self! You cannot be two persons. As you were seventy-two years old, your childhood had passed, vanished, been annihilated for a long time. You cannot see a thing that is not in existence. At least, I cannot understand how, being an old man, you saw yourself in actual childhood.

LUMEN. What forbids your granting this point under the same principle with the others?

INQUIRER. Because one cannot see one's self in double, at the same time a child and an old man.

LUMEN. You have not reflected carefully, my friend. You understood the general fact well enough to admit it; but you have not noticed that this last particular fact returns into the first. You grant that the aspect of the earth was seventy-two years in reaching me, do you not?—that events reached me only some time after their occurrence, — in a word, that I saw the world as it was at that time? You admit, likewise, that in seeing the streets of that time, I saw also children running along those streets. Do you grant that?

INQUIRER. Fully.

LUMEN. Well, then, since I see this group of chil-

dren, and then made part of it, why would you have me not see myself as well as the others?

INQUIRER. But you are not there, in this group.

LUMEN. Once more, let me say, this group has no longer an existence. But I see it as it did exist when left by the ray of light that reaches me to-day. And since I recognize the fifteen or eighteen children who constitute it, there is no reason why the child who was I, should disappear because it is I who look at him. Other observers would see him together with his companions; why would you make an exception in a case where I was the observer? I see them all, and I see myself with them.

INQUIRER. I do not quite apprehend. It is evident, indeed, that seeing a group of children, of which you are one, you cannot but see yourself as well as you see the others.

LUMEN. Now do you understand into what bewildering astonishment such a sight must have thrown me? This child was really I, skin and bone, as the vulgar but expressive phrase is. It was I at six years of age. I saw myself, just as surely as the people in the garden saw me while playing with me. It was not a mirage, not a vision, not a spectre, not a reminiscence, not an image; it was reality, — positively my person, my intelligence, my body. I was there, under my eyes. If my other senses had been as powerful as my sight, I think I could have touched or heard myself. I skipped in the garden, and ran about the little pond which was surrounded by a railing. Presently my grandfather

took me on his knees, and made me read in a big book.

No, I cannot undertake to describe these impressions. I leave you to feel them yourself, if you can fully reconcile yourself to the physical reality of the fact, and will simply declare that never did I experience such a surprise.

One thought especially stupefied me. I said to myself: This child is really myself. He is really living. He grows, and must live sixty-six years more. He is truly and unquestionably I. And, on the other hand, I who am here, aged seventy-two terrestrial years, I who think and see these things, this too, is surely I, and just as much I, as that child. *There are then two of me.* There on earth; here in space. Two persons complete, yet quite distinct. Observers stationed in my place could see this child in the garden as I see him, and could also see me here. There are two of me. This is indisputable. My soul is in that child; it is also here; it is the same soul, my only soul; yet it animates these two creatures. What a marvellous thing! And I cannot say that I deceive myself, that I am under an illusion, that I am betrayed by an optical error. By nature and by science I see myself at once a child and an old man, there and here, — there, careless and happy, here, thoughtful and agitated.

INQUIRER. It is strange, indeed!

LUMEN. And positive. Can you find in all creation a paradox more formidable than this?

What shall I add to my story? I followed myself as

I grew up in the great city of Paris. I saw myself in 1804, entering college and making my first campaign at the time when the First Consul assumed the imperial dignity. I recognized the thoughtful and commanding forehead of Napoleon one day when he held a review in the Champ-de-Mars. I do not remember seeing him during my life, and I was glad to have him pass over my field of observation. In 1810, I saw myself promoted at the Polytechnic School, and talking in the court with that best of comrades, François Arago. That young man was already a member of the Institute, and succeeded Monge at the Polytechnic, owing to the Jesuitism of Binet, of which the Emperor complained. I saw myself soon in the brilliant years of my youth, amid projects of travel and scientific discovery, with Arago and Humboldt, journeys which the latter alone decided to undertake. Then I beheld myself later, during the Hundred Days, rapidly traversing the little wood of old Luxembourg, the street de l'Est and the walk of the Garden of the Rue St. Jacques, and my well-beloved running to meet me under the flowering lilacs. Sweet hours of solitude *à deux*, heart-confidences, soul-silences, transports of love, twilight communion, you come to my astonished gaze no longer as a remote and obscure memory, but in your absolute reality!

I witnessed, again, the fighting of the allies on the hill of Montmartre, their descent upon the capital; the destruction of the statue in the Place Vendôme, which was dragged in the streets amid cries of joy; the en-

campment of the English and Prussians in the Champs-Elysées; the pillage of the Louvre; the journey to Ghent, the return of Louis XVIII. The flag of Elba floated beneath me, and later, as I sought in the Atlantic for the lonely island where the eagle was chained with broken wings, the rotation of the globe brought under my eyes Saint Helena, where I saw the Emperor meditating at the foot of a sycamore.

Thus passed the years as I gazed. Following myself in my marriage, my business, my travels, my studies, I saw the development of contemporary history. To the restoration of Louis XVIII. succeeded the brief reign of Charles X. The days of July, 1830, showed me their barricades, and, not far from the throne of the Duke of Orleans, I saw the column of the Bastille. Eighteen years fled rapidly. I saw myself at the Luxembourg, when they were opening that magnificent avenue that I love so much, and that a recent decree still threatens. I saw Arago again at the Observatory, and the multitude that thronged the gates of the new Amphitheatre. I recognized the Sorbonne of Cousin and Guizot. Then my heart throbbed, as I witnessed the funeral of my mother, an austere woman, and perhaps too severe in her judgments, but whom I had always loved dearly, as you know. The strange little revolution of '48 surprised me no less profoundly than it did the first time I saw it. I saw in the Place de la Bourse, Lamoricière, buried last year, and in the Champs-Elysées, Cavaignac, dead five or six years ago. The Second of December found me an observer at my

celestial post, as I had been in my solitary tower, and thus rolled away, one after another, the events that had already attracted my attention, with others that I had not known.

INQUIRER. Did these events pass rapidly before your eyes?

LUMEN. I could not measure time. But this whole retrospective panorama was certainly displayed in less than a day, — perhaps in a few hours.

INQUIRER. Then I do not understand at all ! Pardon an old friend for this indiscreet interruption ; but according to my imaginings, I had believed that it was the events themselves that you saw, not their simulachre. Only, on account of the time required for the passage of light, they were later than the moment of their occurrence. That's all. If, now, seventy-two terrestrial years had passed before your eyes, they must have occupied exactly seventy-two years in their apparition, and not a few hours. If the year 1793 appeared to you only in 1864, the latter year, in turn, could not, consequently appear to you till 1936.

LUMEN. Your point is well taken, and shows me that you thoroughly comprehend the theory of this matter. I thank you for stating it to me. So I am going to explain to you how I did not have to wait seventy-two new years to review my life, and how, by some unknown power, I really reviewed it in less than a day.

Continuing to follow the course of my life, I reached its last years, signalized by the radical transformation of Paris ; I saw our late friends and yourself, my daugh-

ter and her lovely children, my family and my circle of acquaintances ; and at last the moment arrived when I lay down on my dying bed, and witnessed the closing scene.

This tells you that I had returned to the earth.

Absorbed in the contemplation in which it was engaged, my spirit had speedily forgotten the hill of the old men and Capella. As happens sometimes in a dream, she flew to the object of her gaze. I was not conscious of it at first, so completely were my senses captivated by the strange vision. I can tell you neither by what law, nor by what power, souls can transport themselves so rapidly from one point to another ; but the truth is, *I had returned to the earth* in less than one day, and I entered my chamber at the moment of my enshrouding.

Since on this return journey I went before the luminous rays, I constantly shortened the distance that separated me from the Earth, the light had a less and less distance to traverse, and thus contracted the succession of events. Midway, the rays reaching me with a retardation of only thirty-six years, showed me the earth not of seventy-two, but of thirty-six years before. When three-quarters of the way was passed, the aspects were only eighteen years old. At the half of the last quarter, they reached me only nine years after the events which they represented, and so on ; so that the whole course of my life was condensed within less than one day, in consequence of the rapid return of my spirit, going before the luminous rays.

INQUIRER. This combination is not the least strange phenomenon !

LUMEN. Have other objections occurred to you as you listened ?

INQUIRER. I acknowledge that this was the last, or rather, that it troubled me so much that it prevented me from stating others.

LUMEN. I will show you that there is still another objection — an astronomical one — which I will remove immediately, so that no shadow of it shall be left. Not only would the daily motion of the globe have prevented me from fully comprehending the succession of events, but this movement being inordinately accelerated by the rapidity of my return to the Earth, and seventy-two years flowing away in less than one day, I reflected that it was strange that I had not noticed it. But whether I myself followed the rotation of the globe, and turned in space, while remaining constantly above France, — which seems to me impossible ; — or that the very rapidity of the movements rendered them invisible, and, as it were, isolated objects ; or that some cause unknown to me had obviated the difficulty, I must yield to the evidence, and state that I had, without trouble, witnessed in rapid succession the events of the age and of my own life.

INQUIRER. This difficulty did not escape me, and I had removed it by supposing that you turned in space, just as a balloon is drawn by the rotation of the Earth. It is true that the inconceivable rapidity with which you must have been borne might have caused you a vertigo ;

but I restrict myself to this hypothesis, remembering your remark, that spirits traverse space with the speed and ease of thought, and noting that your view, as well as your unwitting approximation to the Earth, being due to the intensity of your attention to that point of the globe where you saw yourself, it is not impossible that you were constantly held above that point.

LUMEN. As to that, I can affirm nothing, for I am still ignorant. I have not reviewed all the events of my life, but only a few of the chief ones, which, arranged in order, have shown me the whole of my career. They have all been exhibited under the same visual ray. I only know that the ineffable intentness that held me imperiously to the Earth, was as a chain that could have brought me back to it, or, if you prefer the figure, like that mysterious attractive power of the stars, by virtue of which the little stars would impinge directly upon the larger, if they were not kept in their orbits by centrifugal force.

INQUIRER. Thinking of this effect of concentrating the thought on a single point, and the real attraction which it sustains toward that point, I believe that here is the mainspring of the mechanism of dreams.

LUMEN. That is true, my friend; I can vouch for it, — I, who, for many years, have made dreams the special object of my observations and study. When the soul, freed from bodily cares, preoccupations and tendencies, sees in dreams an object which charms it, and toward which it feels drawn, everything about this

object disappears, it stands alone, and becomes the centre of a world of creation; the soul possesses it entirely and unreservedly, gazes upon it, seizes it, makes it its own; the whole universe is forgotten, leaving absolute dominion to the object of the soul's contemplation; and, as happened to me on my sudden return to the Earth, it sees only this object, attended by ideas and images that it engenders and successively produces.

INQUIRER. Your rapid journey to Capella, and your not less rapid return, was, then, caused by this physiologic law; and you acted with far more freedom than in a dream, because your spirit was not encumbered by the machinery of the organism. I remember that in our conversations in former days, you frequently spoke of the power of the will. So you returned to your death-bed before your mortal remains were buried.

LUMEN. I returned, and I blessed the sincere grief of my family, and soothed the anguish of your wounded affection, and tried to impress upon my children the certainty that this bodily envelope was not I, and that I was living in the realm of spirits, in the heavenly region, infinite and unexplored.

I was present at the funeral, and I noted those who were called my friends, and who, detained by some unimportant matter, did not take the trouble to follow my remains to their last resting-place. I listened to the many conversations that followed my burial, and although, in this abode of peace, we are no longer

greedy of praise, I was happy, nevertheless, to know that a pleasant memory of my stay on earth dwelt in the hearts of all.

When the last stone of the vault was put in place, and separated the land of the dead from the land of the living, I gave a last farewell to my poor sleeping body, and as the sun was sinking into his bed of purple, fringed with gold, I remained in the atmosphere till nightfall, admiring the magnificent spectacles that were unfolded in the regions of the air. The Aurora Borealis flung out its silvery ribbon at its pole; the falling stars of Cassiopœa showered, and the cross, with deep slopes, bent toward the west, like the poop of a ship. I saw the brilliant Capella looking at me with her gaze so pure and bright, and I marked the crowns that surrounded her, celestial princes of a divinity. Then I forgot again the Earth, the moon, the planetary system, the sun, the comets, and yielded myself without reserve to the fascinations of Capella's charming look, and felt myself drawn toward her by desire, with a speed far greater than that of electric darts. After a time, whose duration I cannot state, I reached the same ring and the same hill where I had landed the evening before, and saw the old men busily following the history of the Earth, at a retardation of seventy-one years and eight months. They were intent upon events in the city of Lyons, January 23, 1793.

Shall I tell you what was the mysterious cause of my attraction to Capella? Oh, marvel! There are in cre-

ation invisible bonds that do not break like mortal bonds ; there are close correspondences which subsist between souls, despite the separation of distance. The evening of this second day, as the moon enshrined herself in the third ring of gold (such is the sidereal measurement of time), I found myself walking in a lonely avenue, surrounded by flowers and perfumes. I walked on in revery several minutes, when I saw approaching me . . . my beautiful and dearly-loved Eivlys. She was in mature years when she died, and notwithstanding her new look, there were easily recognized the signs of that expansiveness and goodness of heart that a life filled with tenderness had written on her brow, and fixed in her eyes. I shall not pause to describe to you the joy of our meeting ; this is not the place for that, and perhaps, some day, it will be our privilege to talk about the ultra-terrestrial affections which succeed these of ours. I wish only to connect this meeting with the subject of this thesis, by adding, that presently together in heaven we looked upon the Earth, our adopted country, where we had lived days of peace and happiness. We loved, in fact, to turn our eyes again upon that luminous point where we could distinguish a world ; we loved to wed the remembered past with the present, that came to us on wings of light ; and in the ecstasy of this singular experience, we strove earnestly to see again the events of our youth. Thus we really reviewed the sweet years of our early love, the summer-house of the convent, the flower-garden, the walks about Paris, so bewitching and dear, and our solitary

strolls across the fields. To find these years we had only to advance together into space, in the direction of the Earth, to the regions where these aspects, borne on the light, were photographed.

I have made to you, my friend, the strange revelation that I promised. Behold the dawn approaches, and the star of Lucifer already pales under the flush of morning. I go back to the stars. . . .

INQUIRER. One word more, O Lumen, before we close this conversation. Since terrestrial aspects are transmitted only in succession into space, there must be a perpetual present to the eyes ranged in that space, up to a limit determined only by the power of spiritual sight.

LUMEN. Yes, my friend. Place, for example, the first observer at the distance of the moon; he will perceive terrestrial events one and a-half seconds after they occur. Place a second observer at twice that distance; events will be delayed to him three seconds. A third will see them six seconds after the fact. At twice this last distance a fourth will observe them eleven seconds after; and so on. At the distance of the sun, there is a retardation of eight minutes and thirteen seconds. On some planets there is a retardation of several hours, as we have seen. At greater distances we come to whole days. Farther still, to months, to years. On α of the Centaur terrestrial events are seen only three years and eight months after they are passed. There are stars so distant that light does not reach them for many centuries, — even thou-

sands of years. There are *nebulæ* to reach which light must travel several millions of years.

INQUIRER. Hence, in order to be a witness of an historic or geological event of past time, it is only necessary for these penetrating eyes to withdraw to a sufficient distance. Could not one, therefore, in this manner, really look back upon the deluge, the earthly paradise, Adam, and . . .

LUMEN. I told you, my friend, that the coming of sunlight upon the hemisphere puts spirits to flight. A second conversation will enable us, some day, to penetrate deeper into a subject of which I have given you, to-day, only a general outline, and which abounds in new horizons. The stars call me, and have already vanished. Adieu, adieu!

SECOND STORY.—THE REFLUX OF TIME.

I.

INQUIRER. The revelations interrupted by the dawn, O Lumen, left my soul for a long time eager to dive deeper than before into this strange mystery. As the child, when shown a luscious fruit, desires to plunge his dainty teeth into it, and, when he has tasted it, desires still more, so my curiosity seeks new entertainment in the paradoxes of Nature. Is it too serious

an indiscretion to ask some additional questions, that my friends have communicated to me since I repeated our conversation to them? And may I beg you to continue the story of your ultra-terrestrial impressions?

LUMEN. I cannot consent to such curiosity, my friend. Although your mind may be well disposed to receive my words, I am convinced that the details of my subject have not struck you with equal force, and that all do not carry to your mind the evidence of reality. My story has been stigmatized as mystical. Such critics have not at all understood that it is neither a romance nor a fantasy, but a scientific truth, a physical fact, demonstrable and demonstrated, not to be discussed, and that it is as positive as the fall of an ærolite, or the motion of a cannon-ball. The reason that has prevented you and your friends from fully comprehending the reality of the matter, is that the matter happened beyond the Earth, in a region foreign to the sphere of your impressions, and not accessible to your earthly faculties. It is natural that you should not comprehend. (Pardon my bluntness, but in the spiritual world we are frank ; even the thoughts are legible.) You cannot comprehend anything save what belongs to the world of your impressions. And as you are disposed to regard your ideas of time and space as absolute, whereas they are really only relative, you have shut yourself off from understanding the truths which reside outside of your sphere, and are not in correspondence with your organic terrestrial faculties. So, my friend, I should be doing you no real service in

continuing the story of my ultra-terrestrial observations.

INQUIRER. Not in a spirit of mere curiosity, O Lumen, do I allow myself to summon you from the bosom of the invisible world, where the higher spirits must taste ineffable bliss. But I have understood, better than you think, the grandeur of the problem, and inspired by a studious eagerness, do I seek aspects of it more novel even than those I have seen, if I may say so, or, rather, bolder and more bewildering still. By reflection I have reached the conclusion that what we know is nothing, and what we do not know is everything. I am, therefore, disposed to welcome any information. I pray you, let me profit by your observations.

LUMEN. Indeed, my friend, you are either not sufficiently well disposed to receive them, or too well disposed. In the first case, you will not understand them. In the second, you will be too credulous, and will not appreciate their worth. So I return —

INQUIRER. Beloved companion of my earthly life . .

LUMEN. Besides, the facts of which I should now speak to you are more extraordinary still than those you have heard.

INQUIRER. I am like Tantalus in his lake, like the spirits in the twenty-fourth song of Purgatory, like the arms stretched out toward the sweet-smelling apples of Hesperides, like the desire of Eve . . .

LUMEN. Some time after I left the earth, my spiritual gaze returned sadly to this country, when intent

observation of the intersection of the forty-fifth degree of North latitude, and the thirty-fifth degree of longitude, showed me a triangle of hard, gray earth, above the Black Sea, on the western shore of which a miserable company of my poor earthly brothers were slaughtering each other with fury. I began to think of the barbarousness of the so-called glorious institution of war, which then oppressed you, and I saw that in this corner of the Crimea, there perished 800,000 men, ignorant of the cause of their mutual massacre. Clouds were passing over Europe. I was then not on Capella, but in space, between that star and the Earth, about half the distance from Vega; and having left the Earth some time before, I bent my course toward a little nebula which is visible from the Earth, at the left of the just mentioned star. Yet my thoughts recurred, from time to time, to the Earth. Shortly after the observation just reported, my eyes were turned upon Paris, and I was surprised to see it the prey of a popular insurrection. Gazing with sustained attention, I saw barricades on the boulevards, near the Hotel de Ville, in the long streets, and citizens firing upon each other with muskets. My first thought was that a new revolution was going on under my eyes, and that Napoleon III. was driven from his throne. But by the power of a secret communion of souls, my gaze was summoned to a barricade in the faubourg St. Antoine, on which I saw stretched the Archbishop Denis-Auguste Affre, whom I had known slightly. His sightless eyes were turned toward, but saw not, the heavens

where I was ; his hand grasped a green branch. I was, therefore, beholding the days of June, 1848, and especially, the 25th. Some minutes, perhaps some hours, passed, during which my imagination and my reason in turn sought an explanation of this special fact, of seeing 1848 *after* 1854, when my eyes, again attracted to the Earth, noticed a display of the tri-color over a large part of the city of Lyons. Trying to discover the official personage who caused this display, I easily recognized the genial face of the young Duke of Orleans, and I remembered that, after the accession of Louis Philippe, this young prince had, in fact, been sent to quiet the disturbances in the capital of French industry. This showed that *after* 1848 and 1854, I was looking upon an event that happened in 1831. A little later I looked at Paris on the occasion of a public festival. A huge king, with a prominent stomach and a red face, was drawn in a magnificent carriage, and at the moment was crossing the Pont Neuf. It was a beautiful day. Girls dressed in white were posted, like a clump of white lilacs, on the platform of the bridge. Strange animals, covered with bright tints, ran over Paris. Evidently it was the return of the Bourbons to Paris. I could have made nothing of this last mentioned matter, if I had not remembered that, on that occasion, they threw into the air a great variety of balloons shaped like animals. Seen from the heavens, they seemed to run awkwardly over the roofs.

How a past event could be reviewed, I had explained to myself by the laws of light. But to review events

in an order opposite to their actual order, this was altogether fantastic, and would lead me into rambling, I thought, if I attempted to explain this impossibility.

Yet with the facts under my eyes, I could not deny them; I therefore inquired what hypothesis could account for such an anomaly.

The first hypothesis was this: It is surely the Earth that I am looking at, and by a chance, of which God alone knows the secret, the history of France repasses almost by the same phases through which it has already gone: it advanced up to a certain maximum, which is represented by the year of the Exposition Universelle, and returns to its beginnings, by an oscillation which may exist in humanity as in the variations of the magnetic needle, and in the movements of the stars. The persons who seem to me here to be the Duke of Orleans and Louis XVIII., are perhaps other princes who are doing the same things that their predecessors did.

This hypothesis seemed to be very extraordinary, however, and I stopped at a more rational theory.

Given the number of stars, and the planets that revolve around them, I asked myself, What is the probability of finding in space another world exactly like the Earth?

The calculation of probabilities answers this question. The greater the number of stars, the greater the probability that the forces of nature have given birth to an organism like that of the Earth. Now the number of worlds transcends every human numeration made, or

possible to be made. If we knew what was meant by the infinite, we might say that the number is infinite. I concluded that there was a very strong probability in favor of the existence of one or more worlds exactly like the Earth, on whose surface the same history may be made, with the same sequence of events, and which are inhabited by the same animal and vegetable species, the same humanity, the same men, the same families, — all identically the same.

I asked myself, in the second place, if this world, being analogous to the Earth, would not be symmetric with it. Then I entered upon geometry, and the metaphysical theory of images. I became convinced that it was possible that the world in question was like the Earth, but just its inverse. When you look at yourself in a mirror you notice that the ring on your right hand has become the ring on your left hand; that if you wink your right eye, your twin winks his left eye; that if you advance your right arm, your image advances his left arm. Is it impossible that in the infinity of stars there is a world exactly the inverse of the Earth? Surely in an *infinity* of worlds, on the contrary, the impossibility would be that there was none such, and there are millions rather than one. Nature must not only repeat and reproduce herself, but still play under all forms the game of creation. I thought then that the world where I saw these things was not the Earth, but a globe like it, whose history was precisely the inverse of the Earth's.

INQUIRER. I have already thought that this might

be. But was it not easy for you to satisfy yourself and determine if it was the Earth or another star that you were looking at, by ascertaining its geometrical position?

LUMEN. That is just what I did at once, and the result confirmed my opinion. The star on which I had just seen four facts or events analogous to four terrestrial facts or events, but reversed, seemed to me not to occupy the primitive position. The little constellation of Ara was not to be seen, and from that side of the heavens, where, as you remember, the Earth appeared to me in my first episode, there was an irregular polygon of unknown stars. I became convinced that it was not our Earth I was looking at. There was no more room for the least doubt, and I now had for a field of observation a world much more curious, because it was not the Earth, and because its history seemed to represent inversely a picture from the history of the Earth.

Some events, it is true, seemed to have no pendants on the Earth; but in general, the coincidence was very remarkable, especially as the indignation I felt against the makers of war led me to hope that such a scourge did not exist in other worlds, while, on the contrary, most of the events that I had witnessed were battles, or preparations for them.

After what looked like the battle of Waterloo, I saw the battle of the Pyramids. A twin of the Emperor Napoleon had become First Consul, and I saw the Revolution succeed the Consulate. Some time afterwards I saw the court of the Chateau of Versailles filled with carriages in mourning, and in an open path of Ville-

Avray I recognized the slow step of the botanist Jean Jacques Rousseau, who no doubt, at that moment, was meditating on the death of Louis XV. The event which next especially attracted my attention, was one of the *fêtes* early in the reign of Louis XV., worthy daughters of those of the Regency, in which the treasure of France slipped in pearls of water through the fingers of three or four admired courtezans. I saw Voltaire in his cotton cap, in his park at Ferney, and later, Bossuet walking on the terrace of his episcopal residence at Meaux, not far from the little hill that the railroad now cuts, but where I saw not the least trace of this enterprise. In the same succession of events, I saw the roads covered with diligences, and on the sea great ships with sails. Steam had disappeared, with all the industries that it moves to-day. The telegraph was annihilated, together with all the appliances of electricity. The balloons, which had appeared now and then in the field of my vision, were lost, and the last one I had seen was the shapeless globe sent up at Annonay, by the Brothers Mongolfier, in presence of the States-General. The face of the world was already changed. Paris, Lyons, Marseilles, Havre, Versailles, especially, were hardly to be recognized. The first had lost their great animation; the last had gained an incomparable renown. I had formed but an inadequate idea of the royal splendor of the Versailles *fêtes*; I was content with witnessing them, and was deeply touched by the sight of Louis XV., himself, on the magnificent Western terrace, surrounded by decorated courtiers: it

was evening ; the last rays of the fierce sun were reflected on the façade of the palace, noble couples gravely descended the steps of the marble staircase, or vanished in the silent and sombre avenues.

My eyes fondly dwelt upon France, or rather on that region of the unknown world which stood for France to me, — for it is good to be distant, very distant, from one's country ; one thinks of it constantly, and leaves it each time to return to it in tender thought. Think not that disembodied spirits are proud, cold, shorn of every memory ; we should lead sad lives if that were true. No : we retain the faculty of self-recollection, and our hearts are not swallowed up in the life of the spirit. It was therefore with a feeling of keen delight, which I leave you to imagine, that I beheld the whole history of France unfold itself, as if its phases were occurring in an inverse order. After the unification of the people, I saw the sovereignty of a potentate ; after that, the princely feudality. Mazarin, Richelieu, Louis XIII., and Henri IV., I saw at St. Germain. The Bourbons and the Guises began their quarrels for me ; I thought I saw the massacre of St. Bartholomew. Some special facts in the history of our provinces reappeared to me ; for example, a scene in the deviltry of Chaumont, that I had the opportunity of seeing before the church of St. John, and the massacre of Protestants at Vassy. These scenes aroused my indignation ; but I was afterwards agreeably surprised by seeing the magnificent sabre-form comet of 1577. In a plain, far distant, I saw Francis I. and Charles V. saluting

one another. Louis XI. showed himself on a terrace of the Bastille ; the little figures in his hat enabled me to recognize him. Later my eyes, dwelling on a place in Rouen, noticed a great smoke and flames ; amid these was consumed the body of the Maid of Orleans.

Assured that this world was the exact counterpart of the Earth, I divined in advance the events I was to see. Thus when, after seeing St. Louis dying on the ashes at the foot of Tunis, I witnessed the eighth crusade ; then the third, in which I recognized Frederic Barbarossa by his beard ; then the first, in which Peter the Hermit and Godfrey de Bouillon reminded me of Tasso, — I was not greatly astonished. I expected to see in succession Hugo Capet chanting vespers in the cape of an officiating priest ; the Council of Tauriacum declaring that the judgment of God would be pronounced in the battle of Fontanet, and Charles the Bald causing the massacre of a hundred thousand men, and all the Merovingian nobility ; Charlemagne crowned at Rome ; the war against the Saxons and the Lombards ; Charles Martel hammering the Saracens ; King Dagobert building the Abbey of St. Denis, — as I had seen Alexander III. lay the first stone of Notre Dame ; Brunehaut dragged in the road by a horse ; to see the Visigoths, the Vandals, the Ostrogoths, Clovis, Merovius, appear in the country of the Saliens, — in a word, to see the very beginnings of our history unrolled in the inverse order to that in which they happened. And that is, in substance, what occurred. Several very important historical questions, which had heretofore been

obscure to me, were made clear. Thus I ascertained, among other things, that the French are natives of the right bank of the Rhine, and that the Germans have no right to claim that river, especially the left bank.

I felt, in truth, a deeper interest than I can express, in thus witnessing events of which I had only a vague notion, received from the often deceptive echoes of history, and in visiting those countries long ago so changed. The vast and brilliant capital of modern civilization had rapidly grown old, and dwindled to the size of ordinary cities, still embastioned with crenellated towers. I admired, in turn, the beautiful city of the fifteenth century, the curious types of its archæology, the famous tower of Nesle, the huge convents of St. Germain-des-Prés. Where the garden of the tower of St. Jacques now blooms, I recognized the gloomy court of the alchemist Nicholas Flamel. The roofs, round and pointed, looked like mushrooms on a river-bank. Then this feudal aspect itself vanished, giving place to a single mansion in the middle of the Seine, surrounded by cottages, and at last to the open country itself, where were to be seen only a few rude huts. Paris was not, and the Seine rolled its silent waters amid grass and willows. At the same time I noticed that the centre of civilization had been moved or had gone southward. Shall I acknowledge it, my friend? In no experience did my spirit feel so keen a joy as at the moment when I was permitted to see Rome of the Cæsars in its splendor. It was a day of triumph, and no doubt under the Syrian princes, for amid outward

magnificence, brilliant chariots, purple oriflammes, a senate filled with elegant women and singers, I saw an Emperor lazily lolling in a gilded chair, wholly clad in shining silk, and covered with jewels, and gold, and silver ornaments, glittering in the mid-day sun. It could be no one but Heliogabalus, the priest of the Sun. The Coliseum, the temple of Antinoüs, the triumphal arches, and the column of Trajan, were built, and Rome was in all its ancient beauty, its last beauty, which was only a theatrical scene for crowned buffoons. A little later I saw the great eruption of Vesuvius, which overwhelmed Herculaneum and Pompeii. Once I saw Rome in flames, and though I could not identify Nero on his terrace, I was sure that I had nearly looked upon the conflagration of 64, and the signal for Christian persecutions. Several hours afterwards I was busily inspecting the vast gardens of Tiberius, and had just seen that Emperor arrive near a parterre of roses, when, in consequence of the rotation of the Earth on its axis, Judea was brought under my anxious gaze, which instantly descried Jerusalem and the hill of Golgotha. Jesus was climbing this hill, attended by some women, escorted by a troop of soldiers, and followed by a rabble of Jews. The spectacle was one of those that I shall never forget. It was not to me what it was to those who were then present; for the future, and yet past, glory of the Christian Church was displayed before me, as the crown of the divine sacrifice. I will not dwell here; you understand what conflicting emotions troubled my soul at this supreme sight.

Returning toward Rome, I saw Julius Cæsar stretched on his funeral pile, — at his head Antony, whose left hand clasped, I think, a roll of papyrus. In the gratification of a legitimate curiosity, following back the life of Julius Cæsar, I saw him with Vercingetorix in the heart of Gaul, and I was able to determine, that of all our modern hypotheses touching Alesia, not one gives the true place, since this fortress was situated on . . .

INQUIRER. Pardon the interruption, master; but I eagerly seize the opportunity of asking you for light on a certain point pertaining to the dictator. Since you saw Julius Cæsar, pray tell me if his face really resembled that which the Emperor Napoleon, who now reigns in Gaul, has given him in his great work on the life of that famous commander?

LUMEN. I should be delighted, my old friend, to enlighten you on this point, if it were possible. But remember that the laws of perspective prevent me.

INQUIRER. Of perspective? You mean of politics.

LUMEN. No, of perspective, (though the two strongly resemble one another,) for in looking at great men from the height of the heavens, I judge of them otherwise than as they appear to the masses. From the heavens we see men geometrically from above, not in the face; that is, when they are standing, we have only a horizontal projection of them. You remember that we once passed together in a balloon above the Column Vendôme, at Paris, and that you made the remark that Napoleon, seen from above, would not

overtop the level of other men. It is the same with Cæsar. In the other world material measures disappear ; only intellectual measures are known.

However this may be, I went back from Julius Cæsar to the Consuls and the Kings of Latium, to pause briefly at the Rape of the Sabines, which I was glad to be able to observe directly, as an illustration of ancient manners. History has embellished many things, and I noticed that most historical facts reproduced by the painters were quite different from the representations that we have of them. In the same minute I saw King Candaul, in Lydia, in the bath-scene that you are familiar with, the invasion of Egypt by the Ethiopians, the oligarchic republic of Corinth, the eighth Olympiad of Greece, and Isaiah prophesying in Judea. I saw the building of the Pyramids by a host of slaves, under the orders of overseers mounted on dromedaries. The great dynasties of Bactria and India were shown to me, and China displayed to my gaze the wonderful arts that she knew even before the birth of the Western world. I looked for Plato's Atlantis, and found that Bailly's opinions as to this vanished island are not wholly unfounded. In Gaul nothing was to be seen but vast forests and marshes, the Druids had disappeared, and the savages closely resembled those who now inhabit Oceanica. It was the stone age of modern archæologists. Still later I observed that population was gradually diminishing, and that the domination of nature seemed to rest with a race of huge apes, with the bear of the caves, with

the lion, the hyena, the rhinoceros. At last, I could distinguish not only not a single man on the face of this globe, but not the slightest trace of the human race. All had vanished. Earthquakes, volcanoes, and deluges seemed to be sovereigns over the surface of the planet, and no longer to tolerate the presence of man in the general desolation.

INQUIRER. Shall I tell you, Lumen, that I am impatiently awaiting your arrival in the earthly paradise, that I may know exactly how the creation of man was effected on the earth? I am surprised that you seem not to have thought of this important point.

LUMEN. I tell you only what I saw, my curious friend, and I shall be very careful not to substitute for the evidence of my eyes the dreams of my imagination. Now I have not seen the least trace of the Eden so poetically described in modern theogonies. Besides, it would have been very extraordinary if the likeness between the earth and the world I was looking at had gone so far as that, especially as, if there was reason for the Earthly Paradise in the cradle of humanity, I do not see how the same reason should exist at the end of human society.

INQUIRER. I think, on the contrary, that it would be more reasonable to imagine it at the end, as a reward, rather than as the uncomprehended prelude to a life of suffering. But as you did not see it, I will not press my question.

LUMEN. It was my fortune, in concluding my examination of this strange world, whose history is precisely

the reverse of your world's, to see animals of enormous size fighting on the shores of vast seas. There were gigantic serpents armed with terrible claws, crocodiles which ploughed the air, borne on wings longer than their bodies ; hideous fishes, whose throats could have swallowed a whole ox ; birds of prey, waging fearful combats on desolate islands. There were whole continents covered with great forests of trees, with enormous leaves overlapping each other ; stiff and gloomy plants, — for the vegetable kingdom at that time had no fruits or flowers. The mountains vomited sheets of flame ; rivers tumbled in cataracts ; the soil of the fields yawned like huge throats, in which hills, woods, rivers, trees and animals, were swallowed up. But presently I could not distinguish even the surface of the globe ; an all-pervading sea seemed to cover it, and all things, animal and vegetable, gradually faded away, giving place to a monotonous greenishness furrowed by lightning and white smoke. Thenceforth it was a dying world. I witnessed its last heart-beats, seen through intermittent flashes of yellow light. Then I thought that rain fell over its whole surface, for the sun lighted up nothing but clouds and tracks of rain. The hemisphere next to the sun seemed less dark than before, and dull gleams of light crept through the storm. These gleams grew stronger, and spread over the entire sphere. Great chinks glowed red like the fire in a forge. And, as the iron heated in the fiery furnace becomes, in turn, clear red, then orange, then brown, then white and incandescent, so the world passed through all these phases of

gradual heating. Its size increased, its rotation grew slower. The strange globe looked like a huge sphere of molten metal enveloped in metallic vapors. Under the incessant action of its intestine furnace, and the elemental struggles of that marvellous chemistry, it gained enormous proportions, and its incandescent sphere became a sphere of vapors. Then it began to expand continually, losing its original form. Even the sun that illuminated it did not at first surpass it in brilliancy, but swelled its own circumference, so that it became evident to me that the vapory planet was going to lose its existence, becoming absorbed in the expanding atmosphere of the sun.

To see the end of the world is a rare privilege. So, in my enthusiasm, I could not help crying out with a feeling of vanity: "Behold the end of the world, O God! Behold the fate reserved for innumerable inhabited worlds!"

"It is not *the end*," answered a voice in the ear of my soul; "*it is the beginning!*"

"How, the beginning?" I thought.

"The beginning of the Earth itself," replied the same voice. "Thou hast reviewed the whole history of the Earth, *while fleeing from it at a speed swifter than light.*"

This declaration did not astonish me so much as the first episode of my ultra-terrestrial life had done; for now accustomed to the astonishing effects of the laws of light, I was prepared for all kinds of surprises. I had suspected the fact on account of some circumstances

that I cannot tell you without breaking the unity of my narrative, but which were infinitely more extraordinary than the general succession of events.

INQUIRER. But if this were really the Earth, how did it happen that the astronomical observation you had made above in order to establish it in the constellation of Ara, proved to you, on the contrary, that the world you were looking at was neither the Earth nor an asterism of Ara?

LUMEN. Because this constellation also had changed on account of my journey into space. Instead of the stars of the third magnitude, α , γ and ζ , and stars of the fourth magnitude, β , δ and θ , which constitute that figure, as seen from the Earth, my remoteness toward the nebula had made these stars dwindle to little imperceptible points. It had replaced them by other brilliant stars, which, no doubt, were α and β of Auriga, θ , ι , η , and perhaps even ϵ of the same figure, — stars diametrically opposed to the preceding, when seen from the Earth, but which must have been interposed when I had gone beyond them. The celestial perspectives had already changed, and it became, in truth, almost impossible to determine the position of our sun.

INQUIRER. I had not thought of this inevitable change of perspective beyond Capella. So it was really the Earth that you beheld. Moreover, its history was unrolled before you in the reverse of its reality. You saw the events of antiquity happen *after* those of modern times. By what new process did light aid you to follow back the stream of time?

Besides, Lumen, you told me you had observed some curious facts touching the earth itself. I want to ask you some questions about these. I shall listen, therefore, with deep interest, to the marvellous revelations that are going to complete this narrative, convinced that, like those already made, they will fully satisfy my curiosity.

II.

LUMEN. The first circumstance is connected with the battle of Waterloo.

INQUIRER. No one remembers that disaster better than I do : I received a ball in my shoulder near Mont St. Jean, and a sabre-stroke on my right hand from one of Blucher's rascals.

LUMEN. Well, my old comrade, in again witnessing this battle, I see it quite otherwise than as it happened.

When I recognized the field of Waterloo, south of Brussels, I first saw a great number of corpses, a melancholy array of dead lying stretched on the ground. At a distance, through the fog, Napoleon was seen coming backward, holding his horse by the bridle ; the officers with him were also moving backward. Some cannon must have begun to roar, for, from time to time, the dreadful gleam of their explosion was visible. When my eyes had become sufficiently accustomed to the

field, I saw some dead soldiers arouse, awake from eternal night, and get up with a single motion. Group by group a great number thus rose from the dead. Dead horses awoke, as well as their riders, and were remounted. When two or three thousand men had come to life, I saw them form unconsciously in battle array; the two armies confronted each other, and began to fight with a furious madness that seemed like despair. The combat once joined, on both sides the soldiers came to life more rapidly. French, English, Prussians, Germans, Hanoverians, Belgians; gray cloaks, blue uniforms, tunics red, green, and white, rose from the plain of death and plunged into the fight. In the centre of the French army I saw the Emperor; a battalion formed in square surrounded him; the Imperial Guard had come to life again!

Then the huge battalions advanced from two camps, in slow waves; from right and left the squadrons darted. The flying manes of the white horses streamed in the wind. I thought of Raffet's weird picture, and the spectral epigraph of the German poet, Sedlitz :

"The drum sounds strange,
Its echoes beat the skies;
In their trenches, come to life,
The dead old soldiers rise."

And of these other lines :

. "It is the grand review dead Cæsar holds
At midnight, on the Champs Elysées."

It was really Waterloo, but a Waterloo of beyond-the-grave, for the combatants were dead men returned to life. Moreover,—a strange mirage, they marched against each other backwards. Such a battle had a magical effect, which impressed me the more powerfully, as I thought I saw the event itself, and that this event was strangely transformed in its symmetric picture. Another thing not less remarkable: the longer they fought, the more numerous became the combatants; every swath cut by the cannon-shot in the serried ranks was instantly filled by resuscitated dead men. When the hostile armies had mangled each other a whole day, with grape-shot, bullets, bayonets, sabres and swords; when the great battle was ended, not a single dead or wounded man remained; the uniforms, just now ragged and torn, were in good condition, the men were strong, the ranks were close and accurately “dressed.” The two armies slowly withdrew, as if the fiery encounter had had no other end than to bring to life again, amid the smoke of the fray, the two hundred thousand corpses that, only a few hours ago, lay stretched on the ground. What an exemplary and enviable battle! Surely this was the strangest of military episodes. And its moral aspect seemed far more strange than its physical, when I thought that the result of this battle was not the vanquishing of Napoleon, but his establishment on the throne. Instead of losing the battle, the Emperor gained it, the prisoner becoming a sovereign. Waterloo was an Eighteenth Brumaire!

INQUIRER. I only half comprehend this strange effect of the laws of light, and I should like to have you explain it if you can.

LUMEN. I have left you to guess it just now, when I told you that I went from the earth with a speed *greater than* that of light.

INQUIRER. But how, I pray, could this progressive departure into space enable you to see events in an order inverse to that in which they happened?

LUMEN. The explanation is very simple. Suppose you went from the Earth with a speed exactly *equal* to that of light; you would always have with you the aspect of the earth which it wore at the moment of your separation, since you increased your distance from the globe with a rapidity exactly equal to that which brings this aspect into space. Even when you had journeyed a thousand, or a hundred thousand years, this aspect would always cling to you, like a photograph that changes not, while its original grows old in the lapse of time.

INQUIRER. I understood this in our first conversation.

LUMEN. Very well. Suppose now that you went from the Earth at a speed *greater* than that of light. What would happen? You would overtake, as you advanced into space, the rays that started before you; that is, the successive photographs, that second by second, instant by instant, flew off into immensity. If, for instance, you start in 1867, at a speed equal to that of light, you keep the year 1867 eternally with you. If

you went more rapidly, you would overtake rays that started in former years, and carrying photographs of those years.

More clearly to show the reality of this fact, please imagine several luminous rays to leave the Earth at different times. The first, let us suppose, is that of some minute of January 1st, 1867. At the rate of 77,000 leagues per second, it must, at this moment, already have compassed a certain distance, which I will indicate by the letter A. Now imagine a second ray that left the Earth one hundred years earlier, January 1st, 1767; it is one hundred years *ahead* of the first, and has traversed a far greater distance, which I will represent by the letter B. A third ray, say, of January 1, 1667, is still *farther ahead*,—a distance equal to the course accomplished by light in one hundred years. I indicate the place of this third ray by the letter C. A fourth, fifth, a sixth, are, respectively, of the first days of January, 1567, 1467, 1367, etc., and an Echeloned at equal distances, D, E, and F being plunged still further into infinity.

Here, then, you have a series of terrestrial photographs arranged on the same line of distances, and at equal intervals in space. Now the spirit that passes these points, A, B, C, D, E, F, in succession, reviews there the secular history of the Earth at these epochs.

INQUIRER. Master, what distances separate these photographs from each other?

LUMEN. The calculation is very easy. The interval between them is of course that which light traverses in

a hundred years. Now you see at once that at the rate of 77,000 leagues per second, it traverses 4,620,000 leagues in a minute, 277,200,000 in an hour, 6,652,800,000 in an hour, 2,428,272,000,000 in a year, or allowing for bissextile years, 2,429,935,200,000. It follows, consequently, that the interval between two points separated by a *century* of distance, is about 242 trillions, 993½ millions of leagues.

Behold, I say, a series of terrestrial photographs arranged in space at these reciprocal intervals. Suppose now that between each two of these century-pictures there were arranged year-pictures, each two separated by the distance that light traverses in a year, and which I have just mentioned; then that between the year-pictures were day-pictures; then that each day contained pictures of its hours, each hour, pictures of its minutes, each minute, pictures of its seconds, all following each other according to the respective distance between them; we should have in a ray of light, or to speak more exactly, in a jet of light composed of a series of distinct and adjacent pictures, a fluid record of the history of the Earth.

When the spirit journeys in this ethereal ray of pictures, at a speed greater than that of light, it encounters successively the older pictures. When it attains the point where there is the aspect that left the Earth in 1767, it has retraced a hundred years of the world's history. When it overtakes the aspect of 1667, it has retraced two centuries. When it reaches the photograph of 1567, it has reviewed three centuries, and so

on. I told you, at the outset, that I bent my course toward a nebula situated at the left of Capella. It is far beyond that star, though from the Earth it seems to be at its side, because the two visual rays are contiguous; this apparent proximity is simply due to the perspective. To give you an idea of the probable remoteness of this nebula, let me say that it is not smaller than the Milky Way. One might ask, then, to what distance should we suppose the Milky Way removed in order to reduce it in apparent dimensions to the size of this nebula. My friend Arago made this calculation, of which you are aware, since he repeated it annually in his course at the Observatory, and it has been published since his death. We must suppose the Milky Way to be removed to a distance equal to 334 times its length. Now as light occupies 15,000 years in passing from one side to the other of the Milky Way, it follows that it takes light not less than 334 times 15,000,—that is, about five million years to come from it. I followed back the ray from the Earth to this far nebula, and if my spirit-sight had been perfect, I could have viewed the retrograde history not only of ten thousand, a hundred thousand, but even of five million years.

INQUIRER. In order thus to retrace events, as you soared into space, did you have to fly backwards, or are spirits endowed with the power of seeing behind them?

LUMEN. What a question! If I attempted to tell you by what subtle faculties the spirit sees, I should

lead you into the discussion of a problem that you cannot solve. For your personal satisfaction, think that I turned round from time to time, to look at the Earth ; that will be the easiest hypothesis for you.

INQUIRER. How long was this journey toward the nebula?

LUMEN. Have I not told you there is no time beyond the movements of the Earth? Whether I spend a hundred years or half a day in this investigation, it is all the same in the presence of infinity.

INQUIRER. Master, may I tell you a strange thought that has just dawned in my brain?

LUMEN. I tell you this story in order that I may hear your thoughts.

INQUIRER. I just asked if this inversion was possible for the ear as well as for the eye ; if, just as you have seen events in the inverse of their reality, we can also hear a discourse beginning with the end. This is, no doubt, a trifling question, and may seem a ridiculous one ; but in a paradox I think everything deserves attention. So, may I confess it? Just now, while you were speaking of the battle of Waterloo, the idea occurred to me of ascertaining whether you heard . . . the words that tradition attributes to Gen. Cambronne, — if the phenomenon produced by light is also produced by sound.

LUMEN. The laws of sound are essentially different from those of light. Sound travels only 340 metres per second, and its effects have absolutely nothing in common with those of light. Nevertheless, it is evident

that if we moved in the air with a speed greater than that of sound, we should hear inversely sounds proceeding from the lips of an interlocutor. If, for instance, he recites an Alexandrine, an auditor, retiring with the speed above stated, starting from the moment in which he heard the last foot, would successively encounter the eleven other feet which had gone before, and would hear the Alexandrine backwards.

INQUIRER. Hence, to return to the battle of Waterloo, you would have heard . . .

LUMEN. If what happens in the order of light happens also in the order of sound, I should have heard a shapeless jumble of syllables like this :

Pas-rend-se-ne-et-meurt-de-gar-la,*

which would have been incomprehensible to me. I should have sought different meanings in these syllables.

INQUIRER. Perhaps you would have thought, logically modifying the sounds, that Cambronne, answering the summons of the English officer, told him to go to the home of shades, thus :

Pars en ce lieu, et meurs ! De guerre las . . . †

LUMEN. By a material modification of the sounds, should say ! In any case, this half sense would not have satisfied me. I should, no doubt, have sought

* The inverse of *La garde meurt et ne se rend pas*.

† Hence to that place, and die ! Tired of war . . .

thousand meanings, but it is useless to seek them here. As to the theory itself, it suggests this curious reflection, — that nature should have been able to ordain that sound should not travel at the rate of 340 metres per second, but should move more slowly, very much more slowly. Why, for instance, does it not cleave the air with a speed of only some centimetres per second? Now see what would result, if this were so. Men could not speak while walking. Two friends are talking together; one is a step, two steps, in advance, — a metre ahead, say; and as sound occupies several seconds in traversing this metre, it would follow that instead of hearing the sequel of the phrase uttered by his friend, the pedestrian would hear over again, in inverse order, the constituent sounds of the first phrases. Hence, it follows that we could not talk while walking, and that three-fourths of men could not understand one another.

These remarks, my friend, lead me to propose for your consideration a subject very worthy of study, and which has heretofore received but little thought, — the adaptation of the human organism to a terrestrial medium. Man's sight, hearing, sensations, nervous system, form, weight, density, walk, functions, in a word, all his acts, are ruled, indeed determined, by the condition of your planet. Not one of your acts is absolutely free, independent; man is the docile, though unconscious resultant of the organic forces of the Earth.

But to return to my observation of details of terrestrial life, inversely presented by my rapid flight. I will

describe to you now how strange human life looked to me. In the world I was looking at, and which, as we have seen, is no other than your own, men are not born in the natural way that you know of. On the contrary, . . .

INQUIRER. How? on the contrary!

LUMEN. To bring a man into the world they begin by excavating the soil to a certain depth, or, to speak more precisely, they assemble in a kind of fruit-garden; workmen with shovels cast up on the edge of a ditch, friable earth, which, at first sight, seems to have come from the bottom of the ditch. Then they stoop and draw from the hole made in the ground an oblong box, which is borne — not exactly in triumph, but with ceremony — to a temple. Presently I saw the same box come out from the temple, constantly followed by several attendants, some of whom looked sad, while the others seemed quite indifferent. The procession, clad in black, marched backwards.

Soon they reached a house, which they entered backwards with the aforementioned box. What happened afterwards inside the house? That is what I never could see, owing to a peculiar arrangement of the high windows and the lighting. Some chosen persons began to open the box with hammers (a proceeding as strange as the others); then they unpacked its contents and placed them on the bed.

Then approached the supreme moment of the birth of a human being; for this inert body that they had just disclosed was a future living man. All the family

began to weep, as if lamenting the advent of a new creature into this life of sorrow ; some rent their garments, and others — and these were fewest — tore their hair ; others lay as if dead on their couches ; still others knelt at the foot of the bed, and seemed to pray. Physicians, always easily recognizable, arrived, not to despatch the patient, but, on the contrary, to give him life, and in a certain sense to accouch death. Ordinarily, on the second day after his exhumation, the corpse came to life. The minister who had conducted the first ceremony, came to give him baptism and extreme unction. From this moment the new-born is surrounded by all imaginable attentions.

Thus all births were effected. People were born old or middle-aged. Usually one underwent a severe illness before definitely making one of the living. Sometimes there was no sickness, and one rose from the bosom of death as if by accident. Life was from this moment perceptibly different from yours. One grew young, instead of old ; at the prime of life bald heads covered themselves imperceptibly ; white hair became brown or blonde ; the women were sophisticated before they were innocent ; Nature herself repaired the irreparable ravages of time ; men and women attained virility, then adolescence, then first youth, at last fell into childhood, and after passing all these stages, became little, very little babes, up to the moment when they were carried by their relatives to the temple ; then they vanished from the mundane scene by a process which you can imagine by reflecting on the symmetry . . .

INQUIRER. I declare, Lumen, I never heard a more strange and extraordinary story. But how were marriages accomplished in this queer world?

LUMEN. That is not the least curious part of it. All those who are going to be married are born married; whether the husband or the wife be born first, the one who comes second into the world is brought directly to the nuptial home. The children have been born a long time, and are in the middle of life when their parents arrive. The family remains united a certain number of years; each of its members approaches youth. At a certain time the children die, one after the other, becoming very little, and vanishing by the law indicated above.

When the husband and wife have reached the age of adolescence, (though there are many exceptions in the case of the first, but time has nothing to do with the matter,) they enjoy once more a brilliant wedding, and then reluctantly separate with earnest protestations of affection. This retrospective love-making often lasts many years, and it is interesting to see what ardent proofs of mutual attachment the betrothed ones lavish upon one another after the final separation.

INQUIRER. Master, if everything is done in a manner directly opposite to the course of terrestrial nature, how is it about eating, alimentation, and all the connected processes?

LUMEN. My friend, you are like those dreadful children who ask the most indiscreet questions in public. Since you know that things proceed exactly inversely

to the course of nature, you can easily imagine what picture answers your odd question.

Among the details of existence, some appear like, though opposed, to each other. The act of sitting down was to me the act of rising, and conversely. For me the Earth turned in the opposite direction; the morning was the evening, and the evening the morning; but twilight and dawn are so much alike, that I did not notice their inversion, — the less because it presented no difference in details; to dress, for instance, was to me undressing, etc. I will not needlessly prolong this story. My aim was to show you that in order to behold a world and a scheme of life the diametric opposite of yours, it is only necessary to go from the Earth at a speed greater than that of light.

In this flight of the spirit toward the unattainable horizons of infinity, one encounters luminous rays reflected by the Earth and the other planets, thousands and tens of thousands of years ago, and *looking at the planets of this far distance, one can witness the events of their past history*. Thus one remounts the stream of time to its source. Such a power must illumine to your eyes with a new light the regions of eternity. I promise soon to show you its metaphysical consequences, if, as I hope, you admit the scientific validity of the vouchers of this ultra-terrestrial survey.

THIRD STORY.—HOMO HOMUNCULUS.

INQUIRER. I have listened to you, Lumen, with keen interest, yet, I confess, without being fully convinced that all you have told me is true. In fact, it is very hard to believe that one can see all things so directly. When there were clouds, for instance, you could not see, through them, what was passing on the surface of the Earth. It was just so with the interior of houses.

LUMEN. Be undeceived, my friend ; the undulations of the ether pass through obstacles that you would think impenetrable. Clouds are formed of molecules, between which a ray of light can often penetrate. Even if it cannot, there are here and there clear spots through which an oblique view may be had. Very seldom is it impossible to see anything. If this is your last objection, I must say it is far from being insurmountable.

INQUIRER. You have a peculiar method of solving all difficulties. Perhaps this is a prerogative of spirits. I have been required to suppose that you were transported to Capella, with a rapidity surpassing the speed of light ; that you entered upon a world without being in the body there ; that your spirit remained free of the corporeal envelope ; that your ultra-terrestrial vision was strong enough to distinguish from on high what happened here below ; that you could retreat or advance into space at will ; and finally, that the clouds themselves do not prevent you from discerning the surface

of our globe. You must acknowledge that here are some sufficiently serious difficulties.

LUMEN. How earthly you are, my old friend, and how surprised you would be if I undertook now to prove to you that all these difficulties are nothing, and that all which hinder your apprehension of the phenomenon are simple consequences of your natural ignorance. What would you think if I told you that no man has even an idea of what goes on on the earth, and that no one comprehends Nature?

INQUIRER. In the name of the indiscussible truth of science, I should think that you were trying to impose on me.

LUMEN. God forbid! Listen to me, my friend. The marvellous discoveries of contemporary science must have enlarged the sphere of your ideas. You have just discovered spectrum analysis! By the careful examination of a single ray of light which comes from a distant star, you determine what are the elements that compose that unattainable star and feed its fires. That, my young brother in the spirit, is an event more astonishing in itself than all the conquests of Alexander, Cæsar, and Napoleon; than all the discoveries of Ptolemy, Columbus, and Guttenberg; than all the books of Moses, Confucius, and Jesus. What! a gulf millions of leagues in extent yawns between you and Sirius, Arcturus, Vega, Capella, Castor, and Pollux, and yet you analyze the substance of their suns as if you could take it in your hand and test it in the crucibles of your laboratory! How, then, can you refuse

to admit that by processes unknown to you the sight of the soul can catch the very luminous aspect of a distant world, and discern its minutest features? Yes, why? The telegraph transports, in an inappreciable fragment of time, your thought from Europe to America, through the depths of the ocean; two interlocutors talk in low tones, thousands of leagues apart; and you cannot believe my stories because you do not fully understand them? But do you understand *how* the telegram flies and reports itself? You do not? Cease then to cherish doubts which have not even the merit of being scientific.

INQUIRER. My objections, my wise master, were designed merely to bring new light to my understanding. I am far from denying the truth of what you wish to make me comprehend; and I strive earnestly to form a rational and exact idea of it.

LUMEN. Understand, my friend, that I am not at all offended, and in order to expand, at my pleasure, the sphere of your ideas, I can open your eyes to the insufficiency of your terrestrial faculties, and to the fatal poverty of positive science itself, by asking you to reflect that the causes of your impressions are simply modes of motion, and that what is proudly called science is merely a very limited organic perceptivity. Light, by which your eyes see, sound, by which your ears hear, smell, taste, etc., are different modes of motion that impress you. You can appreciate only some of them by the senses with which you are endowed, mainly by sight and hearing. Do you innocently believe that

you see and understand Nature? It is no such thing : you receive some of the motions operating on your sublunary atom : that's all. Besides the impressions that you are conscious of, there is an infinity of others that you know nothing about.

INQUIRER. Pardon me, master. But this new aspect of Nature is not clear enough for me to understand it. Would you . . . ?

LUMEN. The aspect is new to you, to be sure ; but careful reflection will make it plain. Sound is composed of vibrations, that occurring in the air, strike the membrane of your tympanum, and give you impressions of different tones. Man does not hear all sounds. When the vibrations are too slow (less than forty per second), the sound is too low ; your ear does not hear it. When they are too rapid (more than 36,850 per second), the sound is too sharp ; your ear does not appreciate it. Still, outside these two limits of the human organism there are other sounds, heard by other beings, as, for example, the insects. The same reasoning applies to light. The different aspects of light, the shades and colors of objects, are owing to vibrations that strike your optic nerve and give you an impression of different intensities of light. Man sees not all that is visible. When the vibrations are too slow (less than 458 trillions per second), the light is too faint ; your eye cannot see it. When they are too rapid (more than 727 trillions per second), the light transcends your organic power of perception and becomes invisible to you. Beneath and beyond these two limits, colors

exist, and are seen by other beings. You know then, and you can know, only the impressions which throw into vibration the two chords of your organic lyre, which are called the optic and auditory nerves.

Think a moment of the extent of the things that you cannot see. All the undulatory movements in the universe, from those which represent 36,850, to those which represent 458,000,000,000,000, in the same unit of time, you can neither see nor hear; they remain eternally unknown to you. Try to measure this scale! Contemporary science begins to penetrate a little way into this invisible world, and, you are aware, has just measured the vibrations less than 458 trillions—the calorific rays, which are invisible—and those above 727 trillions—the chemical rays, also invisible. But the methods of science can do no more than to extend a little the sphere of direct perception, without being able ever to go farther. You are isolated in the midst of infinity.

More than this. There is an infinity of other vibrations in nature, which, *not being in correspondence* with your organism, and not being receptible by you, *are forever* unknown to you. If you had other chords to your lyre, ten, a hundred, a thousand, the harmonies of nature would reveal themselves more fully, each in its own way. You would perceive many things that exist around you, yet which it is impossible for you to be aware of; and you would form a conception, not of two dominant notes, but of the whole in concert. But you are in poverty without suspecting it, because uni-

versal poverty is not poverty, and it is impossible for you to compare it with the riches of certain beings superior to the inhabitants of the Earth.

The faculties which you possess suffice to show you that there may be other faculties, not only more powerful, but of a wholly different kind. By the sense of touch, for example, you can, it is true, recognize the sensation of heat; but it is easy to conceive the existence of a special sense, analogous to that by which light gives you the appearance of external objects, enabling man to judge of the figure, the substance, the internal structure, and other qualities of an object by the action of the calorific waves that emanate from it. The same reasoning is applicable to the subject of electricity. You can also conceive the existence of a sense that, being, for example, to the eye, what the spectroscope is to the telescope, would inform its possessor as to the constituent elements of bodies. Thus, now, in a scientific point of view, you have a sufficient basis for imagining methods of perception very different from those that belong to terrestrial humanity. There are such senses in other worlds, and there is an infinity of methods of perceiving the operation of the forces of nature.

INQUIRER. I acknowledge, master, that a new and strange light has streamed in upon my mind, and that your teaching seems to me to be a true rendering of the fact. I have already reflected on the possibility of such things; but I had not been able to guess them, hampered, as I was, by earthly faculties. It is certain

that one must stand without our sphere to be able to judge correctly of the whole. So, being endowed only with limited faculties, we can know no facts but those that are attainable by them. The rest naturally remains unknown. Is the rest much compared with what we know?

LUMEN. It is immense ; and what you know is almost nothing. Not only do your faculties not perceive the physical movements, — such as solar and terrestrial electricity, whose currents cross each other in the atmosphere, — the magnetic power of minerals, of plants and creatures, the affinities of organisms, etc. — which are invisible to you ; but they have an even duller perception of the movements of the moral world, sympathies and antipathies, presentiments, spiritual attractions, etc. I tell you this in earnest. What you know, and what you can know by means of your earthly faculties, is nothing by the side of the whole knowable. This truth is so profound, that it is quite possible that beings exist on the Earth, beings essentially unlike you, having neither eyes nor ears, but endowed with other senses, and able to see what you see not, all the time living in the same world with you, knowing what you cannot know, and forming a conception of nature wholly different from yours.

INQUIRER. Now this goes quite beyond my intelligence.

LUMEN. And better still, my earthly friend, I might add in all sincerity, that the perceptions that you have, and which constitute the basis of your knowledge, are

not even perceptions of *the reality*. No. Lights, colors, aspects, tones, noises, harmonies, diverse sounds, perfumes, tastes, the apparent qualities of bodies, etc., are nothing but *forms*. These forms enter into your thought by the gate of your eyes, or ears, or smell, or taste, and show you the appearance, but not the essence of things. *The reality wholly escapes your intelligence, and you are utterly incapable of comprehending the universe.* But I see by the disturbance of your brain, that you no longer understand my revelations. I will, therefore, pursue this subject no further, — which I have descanted upon merely for the purpose of showing how grave would be the mistake of attaching importance to difficulties that result from your terrestrial sensation, and to let you feel that neither you, nor any man on earth, can form even an approximate idea of the reality of the universe. The man of Earth is only an homuncule.

Ah, if you knew the organisms that vibrate on Jupiter or Uranus ; if you could appreciate the faculties in exercise on Venus and in the ring of Saturn ; if some centuries of travel had permitted you to take even a surface-glance at the forms of life in the starry systems, the sensations of sight in the colored suns, the impressions of an electric sense that you know nothing of, in the groups of multiple suns ; if, in a word, an ultra-terrestrial comparison had given you the elements of a new knowledge, you would know that some living beings can see, hear, feel, or, in better phrase, can understand nature, without eyes, without ears, without smell ; that there are other faculties of an unascertainable

number in nature, essentially different from yours, and that there are in creation innumerable wonderful facts which it is absolutely impossible for you to divine. In this general contemplation of the universe, my friend, we see the solidarity that unites the physical to the spiritual world; we recognize, from above, the subtle force that lifts some spirits, tried by the grossness of matter, but purified by sacrifice, to the holy regions of spiritual life; and we realize what great happiness is reserved for those beings who while on Earth have been able gradually to free themselves from the rule of corporeal passions.

INQUIRER. To return to the transmission of light into space,—is not this light finally lost? Does the aspect of the Earth continue eternally visible; or does it, on the contrary, grow dim, in proportion to the square of its distance, and vanish at last?

LUMEN. Your phrase “at last” is inapplicable, in view of the fact that there is no “last” in space. The light wanes in the distance, it is true, and aspects become less well-defined, but nothing is entirely lost. The Earth is not visible to all eyes, at a certain distance, but its aspect survives even when it has passed out of sight, and the spiritual eye can distinguish it. Moreover, the image of a star, borne on the wings of light, flies sometimes to immeasurable depths in the dim obscurity of vacancy. There are vast starless regions in space,—realms decimated by Time, whence the worlds one after another have been drawn away by the attraction of external centres. Now the image of a star travers-

ing these vast voids, is like the image of a person or an object that the photographer has placed in his camera-obscura. These images may meet in such boundless expanses some dark star (the *Mécanique Céleste* has shown that there are many such) in a peculiar condition, and whose surface (formed of iodine, perhaps, if we may believe spectrum analysis) is rendered sensitive and capable of fixing on itself the image of a distant world. In this way terrestrial events are delineated on a dark globe. And if this globe turns on its axis, like other heavenly bodies, it will present its different zones in turn to the terrestrial image, and will therefore take a continuous photograph of events as they follow each other. Moreover, in descending or ascending a perpendicular line to the equator, the line on which the images will be reproduced, will describe no longer a circle, but a spiral; and after the completion of the first rotation, the later images will not coincide with the earlier, will not be superimposed upon them, but will follow them above or below. We may imagine this world to be not spherical, but cylindrical, and to stand in space an imperishable column, on which the events of terrestrial history engrave and enroll themselves. I myself have not seen this result; I quitted the Earth so lately that I have scarcely skimmed, as it were, the first sight of the celestial marvels. Soon I shall satisfy myself as to whether this consummation is not effected in the infinite resources of the astral creation.

INQUIRER. If the ray that leaves the Earth is never destroyed, Master, our actions are then eternal !

LUMEN. You are right. An act done can never be effaced, and no power can put an end to its existence. A crime is perpetrated in the midst of a desert plain. The criminal escapes, remains undetected, and thinks that his deed is *past* forever. He has washed his hands, he has repented, he believes that his act is *effaced*. But in fact nothing of it is lost. In the very instant of its accomplishment, light seized and bore it to heaven in a flash. It is incorporated in a ray of light : itself eternal, it will transmit itself eternally into infinity.

Suppose a good action done in secret ; the benefactor thinks it is unknown ; but the light has seized it. Far from being forgotten, it will live forever.

For the mere gratification of his selfish ambition, Napoleon caused the death of five million men, from thirty years old to middle age, and who had, therefore, still thirty-seven years to live, according to calculated probabilities and the laws of life. He destroyed, therefore, 185,000,000 of years. His punishment and expiation was to be seized by the ray that left the plains of Waterloo, June 18, 1815, and hurled into space with the speed of light itself, to have always before his eyes that critical moment when he saw the scaffolding of his vanity fall forever ; to feel, without respite, the pangs of the same despair, and to remain attached to that ray of light during the 185,000,000 years for whose destruction he is responsible. By doing as he did, instead of

worthily performing his mission, he has delayed, for the period mentioned, his progress in spiritual life.

And if it were granted you to see what happens in the moral order as clearly as you now see what happens in the physical, you would recognize vibrations and transmissions of another kind, which fix in the arcana of the spiritual world actions, and even the most secret thoughts.

INQUIRER. Your revelations are terrifying, O Lumen ! So our destinies are intimately linked with the very framework of the universe. I have given some thought to the speculative problem of possible communication between the two worlds by the aid of light. Many naturalists have believed that communication will one day be opened between the Earth and the moon, and even the planets, by means of luminous signals. But if signals could be made from the Earth to a star whose light occupies, say, one hundred years in coming to us, the signal of the Earth would not reach its destination till the end of this time, and the answer would not arrive here till after an equal period. Two centuries must elapse between the asking of the question and the receipt of the answer. The terrestrial observer would have been dead long before his signal reached his sidereal correspondent, and the latter no doubt would have met the same fate when his answer was received.

LUMEN. That would be, virtually, a conversation between the living and the dead.

INQUIRER. Will you pardon me, Master, for another rather indiscreet question — the last — for I see that

Venus is paling, and I know that your voice will soon cease to be audible.

If our actions are thus visible from the celestial regions, we can see, after our death, not only our own, but those of others, — I mean those in whom we feel a special interest.

For example, two twin and always united souls will love to see again, through thousands of years, the dear scenes they enjoyed together on earth; they will dart into space with the speed of light, and have always before their eyes the same blissful hour. In another case, a husband will follow with solicitude the whole life of his spouse, and when some unexpected feature manifests itself, he can examine at leisure the details that are clear to him. He could even, if his disincarnated companion lived in neighboring regions, summon her to study with himself the history of the past. No denial could avail in the presence of this unerring witness. Perhaps spirits in this way entertain themselves with views of very secret things.

LUMEN. In heaven, my terrestrial friend, they care little for these memories of the material life, and I am surprised that you should still linger at this point. The consideration that should specially impress you in all the facts set forth in these two conversations, is, that by virtue of the laws of light, we can see events after they have passed and have disappeared in reality.

INQUIRER. Be sure, master, that this truth will never fade from my memory. It is just this point that has excited my wonder. Forget my recent digres-

sion. To tell the truth, what most overwhelmed my imagination, after your first discourse, was the thought that the duration of the spirit's journey is not only null and negative, but even *retrograde*. "Time" and "retrograde," these two words, must be very much surprised to find themselves in company. Can one dare to believe it? You start for a star to-day, and will arrive yesterday! What do I say, — yesterday? You will arrive seventy-two years ago! A hundred years ago! The farther you go, the sooner you will arrive! Grammar must be reconstructed.

LUMEN. It is incontestable. In the manner of the earth there was no error in such an expression, since the earth is in 1793 to the world where we landed. You have, moreover, on your own little globe, certain paradoxes which suggest this, — the telegraphic despatch, for instance, which, sent from Paris at noon, arrives at Brest at twenty minutes before twelve.

But it is not these particular applications or curious facts that it is important for you to keep in mind; but rather the revelation of which they are only the form, and the metaphysics of which they are but the comprehensible expression. Know that time is not an absolute reality, but only a transitory measure due to the movements of the earth in the solar system. Seen by the eyes of the spirit, not those of the body, this picture of human life, as it was, without possible variation, which is not fictitious, but real, touches on one side the domain of theology, by explaining naturally a mystery heretofore inexplicable, — that of the "special judg-

ment" of each one of us after death. In a comprehensive view the present of a world is no longer a momentary actuality that disappears as soon as it has appeared, no longer a fleeting aspect, a gate through which the past rushes incessantly toward the future, a mathematical plane in space. It is, on the contrary, an effective reality, which escapes from this world with the speed of light, and plunging eternally into infinity, thus becomes an *eternal present*.

The metaphysical reality of this vast problem is such, that the omnipresence of the world can be conceived throughout its whole duration. Events vanish from the place where they happened, but survive in space. This successive and endless projection of all events occurring in each of the worlds, is accomplished in the bosom of the Infinite Being, whose ubiquity thus holds everything in eternal permanence.

Events which have happened on the surface of the Earth, from its beginning, are visible in space at distances as far ahead as backward. The whole history of the earth, and the life of each one of its inhabitants, could, therefore, be seen by a look which embraced all this space. We understand, optically, by this, that God, everywhere present, sees the whole past in the same instant.

What is true of our Earth is true of all the worlds in space. Thus the whole history of all the universes can be present at once to the universal ubiquity of the Creator.

I may add that God knows all the past, not only by

this direct view, but also by the knowledge of each thing as it happens. If a naturalist like Cuvier could reconstruct animals of extinct species by the aid of a bit of bone, the Author of Nature knows by the Earth of to-day the Earth of the past, the planetary system and the sun of the past, and all the conditions of temperature, the aggregations and formations through which the elements come to form the composite bodies now existing.

On the other hand, the future may be as clearly present to God, in its germs, as is the past in its fruits. Every event is connected indissolubly with the past and the future. The future will inevitably be brought on by the present, is logically deducible from it, and it exists here as surely as the past itself is recorded here for him who can read it.

But, I repeat, the main point of this story is to know, to understand, that the past life of worlds and beings is always visible in space, thanks to the successive transmission of light through the vast regions of infinity.

FOURTH STORY.—ANTERIORES VITÆ.

INQUIRER. Two years have passed, Lumen, since the day of our last mystical conversation. During this period, unnoted by you, a dweller in eternal space, but very perceptible to us terrestrials, I have often

raised my thoughts to the great problems to which you introduced me, and new horizons grew before my mind's gaze. No doubt, too, since you left the Earth, your observations and studies must have expanded on a field whose bounds are ever widening. No doubt, also, you have wonders without number to impart to my mind, now better prepared to receive them. Oh, if I am worthy of it, and if I can understand it, tell me, Lumen, the story of the celestial journeys that brought your spirit to the upper spheres; of the unknown truths that they revealed to you; the sublimities that they opened to you, and the principles that they taught you touching that mysterious subject, — the destiny of man and beings.

LUMEN. I have fitted your mind, my dear old friend, to receive such strange impressions as no earthly spectacle has produced or could produce. It is nevertheless absolutely necessary that you should free it wholly from all terrestrial prejudices. What I shall tell you will astonish you; but receive it with attention, as an established truth, not as a romance. It is a first effort that I exact of your studious ardor. When you comprehend, and you will comprehend if you bring to the task a free and mathematical intelligence, you will see that all facts that constitute our ultra-terrestrial existence, are not only possible, but also real, and, moreover, closely harmonious with our intellectual powers already exercised on this Earth.

INQUIRER. Be sure, Lumen, that I bring a free

intelligence, purged of all passion, and eager to listen to marvels that human ear has never yet heard.

LUMEN. The matters that will be the subject of this relation not only concern the Earth and the stars, but extend over the immense fields of sidereal astronomy, and will inform us as to its marvels. Their explanation will be, as was that of the former problems, aided by the study of light, the magic bridge thrown from star to star, from the Earth to the sun, from the Earth to the stars, — light, the universal motion that fills space, holds worlds in their orbits, and is the essence of the eternal life of Nature. Be careful, then, to keep in mind the *successive advance of light into space*.

INQUIRER. I know that light, that agent by which objects are made visible to our eyes, is not transmitted from point to point, but successively, as something all motion. I know that it moves at the rate of 77,000 leagues per second, traversing 770,000 leagues in ten seconds, or 4,620,000 in a minute. I know that it occupies more than eight minutes in making the mean distance of 37,000,000 leagues that lies between us and the Sun. Modern astronomy has made these facts familiar.

LUMEN. And do you picture to yourself exactly its undulatory motion?

INQUIRER. I think so. I compare it commonly to that of sound, though it takes place on a scale incomparably vaster. In undulation after undulation, sound diffuses itself through the air. When bells ring in peal, their sonorous roar, which is heard at the very moment

they are struck by those living near the church, is not heard till a second later by those living three and one-half hectometres away ; till two seconds by those living about seven hectometres away, and three seconds by those distant one kilometre from the church. Thus the sound progresses successively from one village to another, as far as it can go. In the same way, light moves only successively from the nearest to the farthest point in space, and goes, unextinguished, to distances which belong to infinity. If we could see from Earth an event happening in the moon ; if, for instance, we had instruments powerful enough to see from here a fruit falling from a tree on the surface of the moon, — we should not see the event at the very moment of its occurrence, but a second and a third of a second later, because light takes just that time to come from the moon. If we could also see an event that took place in a world ten times more distant than the moon, we should not see it till thirteen seconds after it actually happened. If this were a hundred times more distant than the moon, we should not see the event till one hundred and thirty seconds after its occurrence ; if it were a thousand times more distant, not till thirteen hundred seconds, or twenty-one minutes and forty seconds later. And so on, according to the distances.

LUMEN. That is correct, and you know that for this reason the luminous ray sent by the star Capella was seventy-two years on the way. If, then, we receive only to-day the luminous aspect of a star parted from its surface seventy-two years ago, conversely, the people

of Capella can see to-day only the Earth of seventy-two years ago. The Earth reflects into space the light it receives from the sun, and from a distance seems bright, as Venus and Jupiter — planets illuminated by the same sun that lights it — seem to you. The luminous aspect of the Earth — its photograph — travels in space at the rate of 77,000 leagues per second, and arrives at Capella, only after seventy-two years of uninterrupted advance. I remind you of these elementary facts, in order that, having them clearly and firmly fixed in your mind, you may easily understand what has happened to me in my ultra-terrestrial life, since our last conversation.

INQUIRER. These principles of optics are quite clear to me. On the day after your death, in October, 1864, when you found yourself, as you told me, rapidly borne to Capella, you were astonished by arriving just when the astronomic philosophers of the country were looking at the Earth of 1793, and one of the rashest acts of the French Revolution.

You were no less surprised presently to behold yourself as a child running in the streets of Paris. In approaching the Earth at a distance less than that of Capella, you fell into a zone whither came the photograph that started from the Earth in your childhood, and you saw yourself, at the age of six years, not in memory, but in reality. Of your former relations this was the one which it was most difficult for me to believe, — that is, to comprehend and exactly discern.

LUMEN. What I now wish to make you understand

is far more surprising. But it was necessary that the first should be admitted, in order that this might be fully understood. In going from Capella and approaching the Earth, I reviewed my seventy-two years of earthly life, directly, just as it passed ; for in drawing near the Earth, I went before the successive zones of terrestrial aspects which bore *in extenso* the visible history of our planet, including that of Paris, and of myself. Traversing retrospectively, in one day, the road which light travels in seventy-two years, I had reviewed my whole life in one day, and come down to my burial.

INQUIRER. It is just as if, returning from Capella to the Earth, you had found, on your way, seventy-two photographs, arranged year after year. That which was farthest from the Earth, the one that started first, and was at the distance of Capella, shows the year 1793 ; the second, which started a year later, and had not yet reached Capella, is of 1794 ; the tenth, 1803 ; the thirty-sixth, which has accomplished half the distance, 1829 ; the fiftieth, 1843 ; the seventy-second, 1865.

LUMEN. The fact, which at first seems mysterious and incomprehensible, could not be more clearly put. Now I can tell you what happened to me on Capella, after I had reviewed my earthly life.

I.

While soon after (I can no longer convey an idea of time in earthly measurements) engaged, in a sombre region of Capella, at the beginning of a clear night, in contemplating the starry heavens, and in these heavens the star which is your terrestrial sun, and in the neighborhood of that little blue planet that is your Earth, — while I was gazing upon one of those scenes of my early childhood, my young mother, seated in a garden, holding an infant a few months old (my brother) in her arms, with a little girl of no more than ten springs (my sister) at her side, and a little boy two years old (myself) : while I was looking at myself at this age, at which man has no consciousness of his intellectual existence, and wears, nevertheless, in his forehead, the germ of his whole life ; while I was thinking of the strange reality which showed *me* to myself at the beginning of my earthly career, I found my attention diverted from your planet by a superior power, and my gaze turned toward another point in the heavens, which, in the same moment, seemed connected with the Earth, and with my earthly life, by some mysterious tie. I could not help dwelling on this new point ; some unknown magnetic power held me to it. Many times I tried to withdraw my eyes, and turn them again upon the earth that I always love, but they obstinately reverted to the strange star.

This star, on which my sight strove instinctively to

make out something, belonged to the constellation Virgo, an asterism, whose form is rather different when seen from Capella. It is a double star; that is, two suns associated, the one of silvery whiteness, the other of vivid gold, revolving around each other in a revolution of one hundred and fifty-nine years. This star is visible from the Earth, and is registered under the letter γ (*gamma*) of the constellation Virgo. Around each of these suns there is a planetary system. My eyes were fixed on one of the planets of the golden sun.

There are plants and animals on it, as on the Earth, and of similar form, though in fact their organisms are on a different plan. There is an animal kingdom like yours, fishes in their seas, and quadrupeds in their atmosphere, where men can also fly, but without wings, owing to its great density. The men of this planet have nearly the terrestrial form, although their heads are hairless; though they have three opposed thumbs, long and slender, on their hands, instead of five fingers, and three toes on each foot, instead of heels; though the extremities of their legs and arms are as elastic as india-rubber; yet they have two eyes, one nose and one mouth, which assimilate their faces to those of Earth. They do not have two ears on each side of the head, but only one, shaped like a conical tent, fixed on the upper part of the head, like a little cup. They live socially, and do not go naked. You see that really they differ but little in external appearance from the inhabitants of the Earth.

INQUIRER. There are then, in the other worlds, beings very different from us, which, in spite of their differences, deserve to be compared with us.

LUMEN. An important distinction, inappreciable to you, constitutes a general dividing line between the animated forms of the different globes. *These forms are the result of elements peculiar to each globe, and of the forces which rule it:* matter, density, gravity, heat, light, electricity, atmosphere, etc., differ essentially between one world and another. Even in the same systems these forms differ. Thus the men of Saturn and Mercury in no wise resemble the men of the Earth; one who saw them for the first time would see in them neither head, limbs, nor faculties. On the other hand, those of the planetary system of Virgo, toward which my eyes were drawn with involuntary persistence, resemble, in form, the people of Earth. They are alike intellectually and morally. A little lower than we are, they are on those rounds of the spiritual ladder, next above that on which terrestrial humanity, as a whole, is placed.

INQUIRER. Terrestrial humanity is not homogeneous in its intellectual and moral worth, but seems to me very variable. We of Europe are very different from the tribes of Abyssinia and the savages of Oceanica. What people do you adopt as a type of the grade of intelligence on the Earth?

LUMEN. The Arabs. They are capable of producing Keplers, Newtons, Galileos, Archimedes's, Euclids, D'Alemberts; moreover, they are connected by their

roots with the primitive hordes of the granite rock. But it is unnecessary here to designate a people as a type. It is better to consider modern civilization as an entirety. Besides, there is not so wide an interval as you seem to think, between the intelligence of a negro and that of a Latin brain. However this may be, if you must have a comparison, I may tell you that the men of Virgo are intellectually very like the Arabs and Scandinavian peoples. The most essential difference between this world and the Earth is, that in the former there is no sex, either of plants, or animals, or humanity. The generation of creatures is spontaneous, as the natural result of certain physiologic conditions concurring in certain fertile isles of the planet, and men are not formed in the bosom of their mothers, as here. It would be futile to explain this process to you, since you could not judge and comprehend it with your terrestrial ideas, from which the life of this planet is quite distinct. It follows from this organic peculiarity that there is no marriage in any form in this world, and the friendship of human beings is never tainted with those carnal passions that always assert themselves here even in the purest attachments between two of opposite sexes.

Drawn, as I told you, toward this distant planet, my spirit's eyes carefully scrutinized its surface. Especially, and just why I know not, did they linger on a white city, looking from afar like a place covered with snow; but probably there was no snow at all there, for it is not likely that water can exist on this globe under

the same chemical and physical conditions as on the Earth. In the outskirts of this city an avenue led to a neighboring forest of brown trees. I soon specially noticed, in this avenue, three persons, apparently going slowly toward the wood. The trio included two friends, who seemed to be conversing intimately, and another, distinguished from them by his red dress and his pack, who must have been their servant, or slave, or domestic animal.

While I was looking at these chief personages with curiosity, the one on the right raised his face toward the heavens, as if some one had called to him from a balloon above, and fixed his eyes steadily in the direction of Capella, which, probably, he did not see, as this scene took place in what was day-time to him. Oh, my friend, never shall I forget the sudden impression made upon me by this sight. I cannot believe myself when I think of it. . . .

This man on the planet of Virgo, who was looking at me without knowing it, was, — may I venture to tell you at once? Well, — it was I!

INQUIRER. How? You!

LUMEN. My very self. I knew myself instantly, and you can imagine my surprise.

INQUIRER. No doubt. So well that I can understand nothing of the matter.

LUMEN. In truth, the situation was quite novel, and needs explanation.

It was indeed myself, and I was not slow to recognize not only my face and figure of former times, but

also in the person who walked by my side, an intimate friend, my dear Kathleen, who was the companion of my studies of this planet. I followed with my eyes as far as the gilded forest, through delightful valleys, shaded with golden cupolas, with trees thick with large orange-tinted branches, and horn-beams with amber leaves. A murmuring brook prattled over the fine sand, and we sat down on its bank. I remembered the dear hours that we had spent together, the happy years we passed on that far Earth, our truly fraternal confidences, the thoughts that stirred us both as we gazed on the woody landscapes, the lonely plains, the misty hills, and the little lakes that smiled at the sky. Our aspirations were exalted to grand and holy Nature, and we worshipped God in His works. With what happiness did I review this phase of my former life, and join anew the golden chain that Earth had broken!

In truth, my friend, it is really I who was living then on that planet of Virgo. I really saw myself, and I could continue to observe the sequence of my actions, and review the best minutes of that life already so far in the past. Moreover, if I had doubted my identity, the uncertainty would have been dissipated, even while I looked; for while I beheld myself, I saw emerging from the woods, and approaching me, my brother in this life, Berthor, who came to join in our conversation on the bank of the murmuring brook.

INQUIRER. Master, I do not quite understand how you could have seen yourself so actually on the planet

of Virgo. Were you endowed with ubiquity? Could you be, like Francis d'Assisi, or Apollonius of Tyana, in two places at once?

LUMEN. By no means. By referring to the astronomical coördinates of the sun *gamma* of Virgo, and knowing its parallax, as seen from Capella, I ascertained that the light of this sun could not occupy less than one hundred and seventy-two years in making the journey to Capella.

I received then, really, (in 1869, terrestrial style,) the luminous ray which left that world one hundred and seventy-two years before (in 1697, terrestrial style). Now it results that at this date I was living on the planet in question, and was already in my twentieth year.

By verifying the ages and comparing the different planetary styles, I found, in fact, that I was born in the world of Virgo in the year 45,904, which corresponds to the year 1677 of the terrestrial Christian Era, and died by accident in the year 45,913, which corresponds to the year 1767. One year of this planet is equal to ten of ours. When I saw myself, as I have just described, I seemed to be about twenty years old, terrestrially speaking. But according to the style of this planet, I was only two years old; there, fifteen years was a common age, and was esteemed the usual limit of life, being equal to one hundred and fifty terrestrial years.

As the luminous ray, — or, to speak more precisely, the aspect, the photograph, of this world of Virgo, occupies one hundred and seventy-two years in traversing

the vast space which separates that world from Capella, it follows that being on the latter star, I received now the image which left the constellation of Virgo one hundred and seventy-two years ago. And although many changes had taken place, many generations had succeeded, and I myself had died, and had time after this date to be born again and live seventy-two years on Earth; nevertheless, the light had taken all this time in passing from Virgo to Capella, and brought me fresh impressions of these past events.

INQUIRER. The duration of the journey of light being a proved fact, I have no objections to urge on that point. Yet I cannot conceal from you that such a marvel transcends all my ideas of the creative power of the imagination.

LUMEN. There is no question of the imagination, my old friend; but of an eternal and sacred reality, which has its honorable place in the plan of the universal creation. The light of each star, direct or reflected, otherwise called the aspect of each sun and planet, pours itself into space at the rate of 77,000 leagues per second, and the luminous ray contains in itself all that is seen. Since nothing is lost, the history of each world, contained in the light which incessantly and successively emanates from it, traverses eternally the infinite space with no possibility of extinction. Terrestrial eyes cannot read it. But there are eyes more powerful than they. Besides, even on the Earth, when you investigate the character of a star through a telescope, or better still, through a spectroscope, you

are aware that it is not its actual character that you are looking at, but its past character, that sends you a ray of light that started perhaps a thousand years ago. You are also aware that certain stars, whose physical and numerical elements you astronomers of the Earth are trying to determine, and which shine brilliantly above your heads, cannot possibly have existed since the beginning of the terrestrial world.

INQUIRER. Very true. So you have seen your penultimate existence displayed under your eyes, one hundred and seventy-two years after it was lived.

LUMEN. Rather a phase of that life. But I could have seen — and evidently shall see — the whole of it in review, as I approach that star, just as I saw the whole of my terrestrial life.

INQUIRER. So that you have reviewed in light your two incarnations?

LUMEN. Exactly: and what is more, I have seen them, and I do see them still together, *simultaneously*, one by the side of the other, so to speak.

INQUIRER. You reviewed them at one and the same time?

LUMEN. The thing is easily comprehensible. The light of the Earth travels seventy-two years in going to Capella. The light of the planet of Virgo, almost one and a half times more distant from Capella, travels one hundred and seventy-two years. As I lived on the Earth seventy-two years ago, and a hundred years before that on another planet, these two epochs reach me on Capella at precisely the same time. I have, there-

fore, before me, looking exclusively at these two worlds, my last two lives, which unroll themselves naturally, as if I were not here to see them, and without my being able to modify at all the acts I see myself on the point of committing, in one, as in the other, since these acts, though present and future to my actual gaze, are really past.

INQUIRER. Strange, indeed! Very strange!

LUMEN. What especially struck me in this unexpected observation of my last two lives, disclosing themselves together to me on two distinct worlds, and most closely engaged my attention, was the curious resemblance of the two lives. I see that I had very nearly the same tastes, passions and faults, in the one as in the other, — neither a criminal nor a saint in either. Besides, (a strange coincidence!) I saw in the first, landscapes like those I had seen on Earth. Thus I was made to understand the innate fondness that I brought to the Earth, for the poetry of the North, for the verses of Ossian, for the dreamy landscapes of Ireland, for mountains, and the Aurora Borealis. Scotland, Scandinavia, Sweden, Norway, with its fiords, Spitzbergen, with its solitudes, attracted me. Old ruined towers, rocks, and savage gorges, the sombre fir-trees, through which the north wind murmurs, — all these seemed to me on Earth to have some hidden relation with my inmost thoughts. When I saw Ireland, I seemed to have already lived there. When I ascended, for the first time, the Righi and the Finsteraarhorn, and saw the magnificent sunset on the snowy Alpine peaks, I

seemed to have looked upon those sights long ago. The spectre of Brocken was not new to me. It was because I had lived fifty years in similar regions on the planet of Virgo. The same life, the same acts, the same circumstances, the same conditions. Analogies! analogies! Almost everything that I had seen, done or thought on the Earth, I had seen, done or thought a hundred years before, in this earlier world.

I always suspected it!

The entirety of my terrestrial life is yet superior to the entirety of that which preceded it. Every child brings into life different faculties, special predispositions, innate dissimilarities, quite undisputed, and which can be explained according to the spirit of philosophy and the eternal Justice, only on the hypothesis of works previously done by free intelligences. But though my terrestrial life may be better than that which preceded it, principally by reason of a more exact and profound knowledge of the system of the world, I must yet remark, that certain physical and moral faculties that I formerly possessed, failed me on Earth. On the other hand, I had in this world faculties that I had not previously received.

Thus, for example, among the physical powers that I lost on Earth, I will mention especially that of flight. In the planet of Virgo, I see that I flew as often as I walked, and that, too, without aeronautic appliances or wings, — simply with my arms and legs, as one swims. In scrutinizing this mode of locomotion that I distinctly saw myself employing on that planet, I easily

see that I have — that I had, I mean — neither wings, nor balloon, nor helix. At a given moment I darted from the ground, as with a vigorous movement of my legs, and stretching my arms, swam with ease in the air. At another time, descending on foot a steep mountain, I launch myself into space with joined feet, and drop gently and obliquely, at will, till my feet touch the ground and I stand erect. At still another time, I fly slowly, like a dove describing a curve, as it returns to its cote. This is what I clearly saw myself do in that world.

Oh, not once, — a hundred, a thousand times, perhaps, I felt myself thus borne away in my terrestrial dreams; exactly so, gently, naturally, and without artificial aids. How could such impossibilities come to us in our dreams? Nothing can warrant them; there is no analogy to them on the Earth. Instinctively yielding to this innate impulse, I have often darted into the atmosphere, bound to the gas-bubble of an aeronaut; but the impression is not the same; you do not *feel yourself fly*, and think you are hardly moving. My dreams are now explained to me; while my earthly senses sleep, my soul remembers its former life.

INQUIRER. I, too, have often felt and seen myself fly in a dream, and just in that way, by a mere voluntary movement of the body, without wings or apparatus. Is it because I have lived on the planet of Virgo?

LUMEN. I don't know. With good eyes or powerful glasses, you could, even from your globe, have seen that planet, examined its surface, and if, peradventure,

you lived there when the luminous rays that reach the Earth left it, you could possibly have seen yourself there. But your eyes are not strong enough for such an enterprise. Besides, it is by no means necessary that you should have inhabited this world in order to have possessed the power of flight. There are many worlds in which flight is the normal condition, and where all the human race lives by this power. Indeed, there are few planets where people crawl as they do on the Earth.

INQUIRER. It would seem from your former vision, that your terrestrial existence is not the first, and that before living on the Earth, you had already lived in another world. Do you believe, then, in a plurality of existences of the soul?

LUMEN. Do you forget that you are addressing a disincarnated spirit? I must yield to proof, having before me my life on Earth and my previous life on the planet of Virgo. I remember, too, many other existences.

INQUIRER. Ah, that is just what I lack to complete my conviction. I remember absolutely nothing of what may have preceded my Earthly life.

LUMEN. You are still in the flesh. Wait till you are free to remember your spiritual life. The soul has full memory, full possession of itself only in its normal, its celestial, life, that is, between its incarnations. Then it sees, not only its terrestrial life, but the lives which went before that.

How could a soul hampered by the gross bonds of

the earthly flesh, and thus imprisoned for a transitory work, remember its spiritual life? How could such recollection fail to be harmful to it? How it would trammel its freedom of action, showing to the soul its beginning and its end! How could one deserve one's fate, knowing it? Souls incarnated on Earth have not yet reached a stage of growth high enough for the recollection of their former state to be useful to them. The caterpillar does not remember his rudimentary life in the egg. The chrysalis recalls not the days of toil when it crept on the flat plants. The butterfly, flitting from flower to flower, has no recollection of the time when his mummy dreamed, hanging from a spider-web, or of the twilight when his larva trailed from herb to herb, or of the night when the shell of a seed entombed it. Yet the egg, the caterpillar, the chrysalis, and the butterfly, are none the less one and the same living thing.

INQUIRER. Yet, Master, if we had lived before this life, something of the former life would remain to us. Otherwise anterior existences would be as if they had never been.

LUMEN. What! Is what happens on Earth in the matter of innate aptitudes nothing? Two children are born of the same parents, receive precisely the same education, are surrounded with the same anxious care, live in the same atmosphere. Now look at each of them. Are they alike? Not at all. There is no likeness between their souls. One has peaceful instincts and great intelligence; he will be good, wise, learned,

eminent, perhaps, among thinkers. The other has the instincts of tyranny, of envy, perhaps of brutality. His career, becoming more and more clearly outlined and pronounced, will lead him undoubtedly to the first rank in arms, and will give him that glory (little to be desired, but admired on the Earth) which attaches to the name of official murderers. Feebly or palpably, this difference of character, which depends on neither family, nor race, nor education, nor bodily state, is manifested among all men. Now you can reflect on this at your leisure; you will come to the conclusion that it is absolutely inexplicable, and that its explanation can be found only in an anterior life of the soul.

INQUIRER. But most philosophers, and teachers of theology, have taught that the soul was created at the same time with the body.

LUMEN. And in what precise moment, pray tell me? At the moment of birth? But legislation, as well as physiology, knows perfectly well that the child lives before he emerges from his uterine prison, and to destroy an eight-months' fœtus is murder. At what time, then, do you think the soul appears suddenly in the fluid head of the fœtus, or the embryo?

INQUIRER. Several fathers of the church have fixed upon the sixth month of gestation; others upon the very moment of conception.

LUMEN. Oh, bitter mockery! You would have the eternal designs of the Creator subjected in execution to the capricious passions, the intermittent flame of two amorous hearts! You would dare to say that our

immortal being is created by the contact of two bodies ; you are inclined to believe that the Supreme Thought that governs worlds, will put itself at the service of chance, of intrigue, of passion, and sometimes of crime ? You can believe that the number of souls depends on the number of flowers touched by the sweet pollen of golden wings ? But is not such a doctrine, such a hypothesis, blasphemous of divine majesty, and of the spiritual greatness of our souls themselves ? Moreover, would this not be the utter materialization of our intellectual parts ?

INQUIRER. I confess it would be very strange if an event so important as the creation of an immortal soul were remitted to a cause so unspiritual, were the fortuitous result of unions more or less legitimate. I admit, also, that the difference of aptitudes that we bring into this world is not explained by organic causes. But, I ask, what would be the use of anterior lives, if, when we entered a new one, we could not remember them. I ask, also, if it is really desirable for us to have in prospect an endless journey through the worlds, — an eternal transmigration. For, indeed, there must be a limit to all this, and after so many centuries of travel, we must come at last to repose. Therefore, as we rest immediately after one life . . .

LUMEN. O man, you know neither space nor time ; you do not remember that beyond the movement of the stars, time is not, and eternity is not measurable ; you do not remember that in the infinity of the sidereal vastness, space is but a vain word, and cannot be

measured ; you ignore all this : principle, cause, end, all escapes you ; an atom on a moving atom, you have no exact appreciation of the universe ; and in such ignorance, such darkness, you want to understand, to infold, to grasp everything ! It would be easier to pour the ocean into a nut-shell than to make clear the law of destiny to your poor earthly brain. Can you not, then, making a legitimate use of the faculty of induction that you possess, rest at the direct results of rational observation ? This shows you that we are not come into this world as equals ; that the past is like the future, and that eternity, which is before, is also behind us ; that nothing creates itself in nature, and nothing annihilates itself : that Nature extends over every living thing, and that God, spirit, law, number, are no more outside of Nature, than are matter, weight, and motion ; that there are moral truth, justice, wisdom, virtue in the progress of the world, as well as physical reality ; that justice ordains equity in its assignment of dooms ; that our destiny is not accomplished on the terrestrial planet ; that the empyreal heaven exists not, and that the Earth is a star in the firmament ; that other inhabited planets wander with our own in infinity, offering to the wings of the spirit an inexhaustible expanse ; and that the infinity of the universe corresponds, in the material creation, to the eternity of our spiritual being in the spiritual world. Cannot such certainties, together with the inductions that they suggest, avail to free your mind from ancient prejudices, and to submit

to its unbiased judgment a panorama worthy of the vague, yet profound desires of our hearts?

I could illustrate this general sketch by examples and details that would, perhaps, impress you more forcibly. Let it suffice to add that there are other forces in Nature than those you know of, and whose essence and mode of action are quite different from electricity, attraction, light, etc. Now among the unknown forces of Nature there is one whose further study will lead to strange discoveries, illustrative of the problems of the soul and life. This invisible fluid force is the mysterious bond that binds together living beings, unconscious of the tie, and which is manifested in many circumstances. Take two beings who love each other. It is impossible for them to live apart. If dire necessity separates them, the two lovers lose their reckoning, and their souls will incessantly desert their bodies to rejoin each other. The thoughts of the one are shared by the other; each feels the other's emotions, and they live together, though separated. If any misfortune befalls one of them, the other suffers from the rebound. Such separations have been known to cause death. How many facts do you not know, facts beyond question, as to the voluntary apparition of some one to an intimate friend, of a wife to her husband, or a mother to her son, and *vice versa*, — happening at the moment of the death of the person appearing, sometimes a long distance away? The most rigid criticism cannot now deny these facts so clearly authenticated. Two twins, living ten leagues apart, in very different circumstances, suffer at one time with

the same malady ; or if one of them is unusually tired, the other feels an uneasiness that he cannot account for. And so on. These many facts prove the existence of a bond of sympathy between souls, and even between bodies, and lead me to remark once more, that we are far from knowing all the forces at work in Nature.

I tell you this, my friend, especially in order to show you that you may have a presentiment of the truth before death, and that terrestrial life is not so devoid of light that one cannot, by reasoning, come to a knowledge of the main features of the moral world. Besides, all these truths must come out again in the sequel of my narrative, when I shall have shown you that it is not my penultimate existence alone that I have directly reviewed, thanks to the sluggishness of light, but my ante-penultimate life, also, and up to the present time, more than ten lives which preceded that in which we knew each other on Earth.

II.

INQUIRER. Reflection and investigation have already led me toward belief in the plurality of spiritual existences. But this theory not having in its favor the logical, moral, or even physical proofs, so numerous and clear in support of the plurality of inhabited worlds, I confess that hitherto I have doubted. Modern optics

and mathematics, which let us touch the other worlds with our fingers, so to speak, show us their movements, their years, seasons, and days, help us to witness the varieties of animate nature on their surfaces; all these elements have enabled the astronomer of to-day to establish this doctrine of the existence of humanity in other worlds on a solid and indestructible basis. But, once more. It is not the same thing as palingenesis, and though I am strongly inclined to believe in the transmigration of souls in the real heaven, since that is the only medium by which we can represent eternal life, my aspirations demand, for the support and confirmation of this opinion, a light that I have not yet.

LUMEN. This very light, and its results, will be the subject of this conversation. I have, I acknowledge, an advantage over you, since I speak of what I have seen, and limit myself strictly to giving an exact interpretation of terrestrial events with which my spiritual life is interwoven. But since your mind can feel the possibility, the fidelity of the scientific explanation of my narrative, it cannot fail, by listening, to enlighten itself and increase its knowledge.

INQUIRER. For this reason, I am always thirsty to hear you.

LUMEN. Light, as you have seen, is the agent that gives the disincarnated spirit the *direct view* of its planetary lives.

After reviewing my terrestrial life, I reviewed my penultimate life on one of the planets of *Gamma* of Virgo.

As the light brings me the first, with a retardation of seventy-two years, and the second, with a retardation of one hundred and seventy-two years, I see, to-day, from Capella, what I was on Earth seventy-two years ago, and what I was on the world of Virgo one hundred and seventy-two years ago. Behold, then, two lives *past and successive*, brought to me here *present and simultaneous*, by virtue of the laws of the light which bears them to me.

About five hundred years ago I lived in a world, whose astronomical position, seen from the Earth, is exactly that of Andromeda's Breast, — the left breast. Surely, the inhabitants of that world do not suspect that the people of a little planet in space have joined the stars by imaginary lines, traced the faces of men, women, animals, and divers objects, and incorporated all the stars (in order to give them a name) in these figures, more or less original. Planetary men would be astonished to hear that on the Earth certain stars bear the names of Scorpion's Heart (what a heart!) Dog's Head, Great Bear's Tail, Bull's Eye, Dragon's Neck, Capricorn's Head! You know that the constellations marked on the celestial sphere, and the positions of the stars on this sphere, are not real or absolute, but are merely due to the place of the Earth in space, and thus are only a matter of perspective. Any one who, from the top of a mountain, takes a circular panoramic view, and marks on his plan the respective positions of all the peaks that he sees, the hills, valleys, villages, lakes, constructs a chart that will be useful only for the place

where he stands. If he removes to a point twenty leagues away, the same peaks are visible, but they occupy quite different positions relatively to each other, owing to the change of perspective. The panorama of the Alps and the Oberland, seen from Lucerne and Pilate, is nothing like that which is viewed from the Faulhorn or the Scheinige Platte on Interlaken. Yet the peaks and the lakes are the same. It is precisely so with the stars. The same ones are seen from δ of Andromeda, and from the Earth. Yet not a single constellation can be reestablished in its place; all the heavenly perspectives are changed; stars of the first magnitude have become stars of the second or third; some of a lower class, seen near at hand, have become brilliant; and more than all, the places of the stars relatively to each other, have been wholly changed according to the difference of position between each and the Earth.

INQUIRER. So the constellations that for so long a time we have believed to be traced ineffaceably on the vault of heaven, are due simply to perspective. With every change of position perspectives change, and the heavens are no longer the same. But must we not ourselves have a change of perspective every six months, since in that time the Earth has perceptibly changed its position and has moved to a distance 74,000,000 leagues from the point it occupied six months before?

LUMEN. This objection shows me that you clearly understand the principle of the deformation of the constellations in proportion to their advance from any

quarter into space. It would be so, in fact, if the terrestrial orbit were large enough so that the two opposite points of this orbit could change the view of the celestial landscape.

INQUIRER. Seventy-four million leagues —

LUMEN. Are nothing in the estimate of celestial distances, and can no more change the perspectives of the stars than a step on the sky-light of the Pantheon could change to an observer the apparent positions of the buildings of Paris.

INQUIRER. Certain charts made in the middle ages, give the Zodiac as the centre of the Empyrean, and place certain constellations, such as Andromeda, Lyra, Cassiopœia, Aquila, in the same region with the Seraphim, the Cherubim, and the Thrones. This was a high flight of imagination, if constellations do not really exist, and are merely apparent approximations, due to perspective.

LUMEN. Clearly. The old heaven of theology no longer has any right of existence, and common sense shows that it does not exist. Since two truths cannot be opposed to each other, the spiritual heaven must accord with the physical; it is the special purpose of my conversations to prove this to you.

On the world of Andromeda, which I just mentioned, there is no longer any constellation of Andromeda. The stars that, seen from the Earth, seem associated, and have seemed to represent in the celestial landscape the daughter of Cepheus and Cassiopœia, are scattered at various distances and in all directions. Neither

there, nor elsewhere, can there be found the slightest trace of the terrestrial mythology.

INQUIRER. Poetry is the loser. I should certainly feel an agreeable satisfaction in the thought that I should live a whole life on the bosom of Andromeda. That embodies an image. The idea blends a lively sensation and a mythologic perfume. I should really like to be transported there, fearless of the monster, and indifferent to young Perseus, with his Medusa's head and the famous Pegasus. But now, thanks to the scalpel of science, there is no longer a princess exposed, unveiled, on the sea-shore, nor a virgin holding a spike of gold, nor Orion pursuing the Pleiades; Venus has vanished from our evening sky, and old Saturn has dropped his scythe into the night. Science has put them all to flight! I deplore this progress.

LUMEN. Do you prefer the illusion to the reality? And do you not yet know that the truth is incomparably more beautiful, more grand, admirable and marvellous than error, even when most adorned? What in all mythologies, past and present, can be compared to the scientific contemplation of celestial sublimities and the operations of Nature? What impression could strike the soul more forcibly than the *fact* of space peopled by worlds, and the vastness of the sidereal systems? What words are more eloquent than the silence of a starry night? What idea could plunge the soul into an abyss of more unappeasable astonishment than this intersidereal journey of light eternizing the current events of each world? Rid yourself, my friend, of these

old errors, and be truly worthy of the majesty of science. Listen to what follows :

By reason of the time occupied by this light in coming from the system δ of Andromeda to Capella, I reviewed in that year, 1869, my ante-penultimate life, lived five hundred and fifty years before. This world is strange to our notions. There is only one kingdom in it,—the animal kingdom, on its surface. It has no vegetable kingdom. But this animal kingdom is very different from ours, though its superior, intelligent species possesses five senses as on the Earth. It is a world without sleep and stability. It is wholly enveloped in a rose-colored ocean, less dense than the water of Earth, and more dense than air. It is a substance which holds the middle place, as a fluid, between air and water. Do not try to imagine it exactly ; you will not succeed, because terrestrial chemistry affords you no similar substance. Carbonic acid gas, that is invisible in the bottom of a glass, and is poured out like water, may give you an idea of it. This condition is owing to a determinate quantity of heat and electricity always on this globe. You know that there are on the Earth, in the texture of all creatures, minerals, vegetables and animals, but three states of bodies, the solid, liquid and gaseous, and that these are due to the heat poured by the sun upon the Earth's surface. The interior heat of the globe has no action save what is imperceptible on this surface. A deficiency of solar heat would liquify gases and solidify liquids. An excess of heat would melt solids and evaporate liquids. We

have only to suppose a greater or less quantity of heat, in order to make the air a liquid (the air a liquid, do you hear?) and marble gaseous. If, for any reason, the terrestrial planet moves some day on the tangent of its orbit, and goes into the icy obscurity of space, you will see all the water on the Earth become solid, the gases in their turn become liquid, then the solids themselves — you will see — no, you will not see, remaining on the Earth, but you could, from the depths of space, witness this very curious sight, if your globe should ever venture to go off at a tangent. And observe furthermore, if the advent of this colossal chill were sudden, creatures would be instantly frozen in their tracks, and the globe would carry into the infinite expanse the strange panorama of all races, human and animal, fixed and motionless for eternity in the several positions that each individual happened to occupy at the moment of the catastrophe.

There are worlds in this condition. Such are comets, whose inhabitants, stopped insensibly in their course of life by the rapid flight of the comet far from the sun, are like millions of statues. Most of them are lying down, because this great change of temperature occupies several days in its accomplishment. There they are, by millions, pell-mell, dead, or to speak more accurately, slumbering in a profound lethargy. The cold conserves them. Three or four thousand years later, when the comet returns from its dark and icy aphelion to its brilliant perihelion, the genial heat touches this surface with its beneficent rays, and it

rapidly expands. When it reaches the degree of temperature natural to these beings, they revive, just as old as they were at the moment they fell asleep, they resume their business of the evening (an old evening!) not in the least aware that they have slept so many centuries. Some are seen to resume a game where they left off, or finish a phrase whose first words were uttered four thousand years ago. All this is very simple. We have seen that time has no real existence.

This is on a grand scale what happens on Earth on a small one, with the resuscitated infusoria, who come to life under the rain, after many years of seeming death.

But to return to our world of Andromeda: the semi-liquid, rose-colored atmosphere, which surrounds it entirely, like an isleless ocean, is the abode of the animate beings of this globe. Never resting on the bottom of this ocean, that no one has ever reached, they float endlessly on the bosom of this mobile element. From birth to death, they have not a minute of repose. Indeed, incessant activity is the condition of their existence. If they paused, they would perish. To breathe, that is, to receive the fluid element into their breasts, they must keep their tentacles in constant motion, and their lungs — I use this word in order to make myself understood — always open. In external form, this human race somewhat resembles sirens, but they are less graceful, and more like the seal in structure.

Do you see the essential difference which distinguishes their organism from that of terrestrial men?

It is this : that on Earth we breathe without noticing it, without any effort to obtain oxygen, without being obliged with difficulty to effect the transformation of venous into arterial blood, by the absorption of oxygen. In the other world, on the contrary, living costs labor, incessant effort.

INQUIRER. Then that world is inferior to ours in the degree of improvement?

LUMEN. Undoubtedly, since I lived in it before I went to the Earth. But don't think that the Earth is very much superior because we can breathe in our sleep. Of course, it is a wonderful thing to be furnished with pneumatic machinery that opens of itself every second, as often as our organism needs the least breath of air ; it is wonderful, too, that this automaton operates, when even those who possess it do not see its beauty or appreciate its value. But man does not live by air alone ; the terrestrial organism needs a complement more solid, and this complement does not come to it unattended. What happens? Look at the Earth for a moment. See what a sad, what a desolate spectacle ! What a world of misery and brutishness ! All these multitudes bent to the ground, that they scratch painfully, begging it to give them food ; all these heads bowed to matter, instead of being lifted to look upon Nature ; all these struggles and toil entailing feebleness and disease ; all this bargaining for the heaping up a little gold at others' cost ; the employment of man by man ; caste, aristocracy, robberies and ruins ; ambitions, thrones and wars ; in a word, *personal interest*,

always egoistic, often sordid, and the rule of matter over spirit ; that is the ordinary representation of the Earth — a state of things permitted by the law which governs your body, which forces you to kill in order to live, and to prefer the possession of material goods that cannot be carried beyond the tomb, to intellectual wealth, that the soul keeps forever, inalienable.

INQUIRER. You speak, Master, as if you thought it was possible to live without eating.

LUMEN. What ! do you think one is wedded to such a ridiculous proceeding in all the worlds of space ? Happily, in most of them, the spirit is not subjected to such an ignominy.

It is not so difficult as might be supposed to conceive of nutritive atmospheres. The nurture of life in man and animals depends on two causes, — respiration and nutrition. The first resides naturally in the atmosphere ; the second, in nourishment. From the latter, blood is made ; from blood proceed the tissues, muscles, bones, cartilages, skin, brain, nerves, — in a word, the organic constitution of the body. The oxygen that we breathe may be considered a nutritious substance, for, combined with the alimentary principles absorbed by the intestines, it makes blood and develops the tissues.

Now, in order to imagine nutrition as taking place wholly within the domain of the atmosphere, it is only necessary to observe that, in fact, perfect aliment is composed of albumen, sugar, fat and salt, and to note that an atmospheric fluid, instead of being composed

of azote and oxygen alone, may be formed of these different substances as gases.

In our present state our aliment is in solid bodies, from which we derive nourishment, and to the digestion belongs the duty of disintegrating and assimilating them to our organism. When we eat a bit of bread, for instance, we introduce into our stomach some fecula and some starch, substances insoluble in water, and not found in the blood. Saliva and the pancreatic juice transform the insoluble starch into soluble sugar. Bile, the pancreatic juice, and the intestinal secretions change the sugar into fat. Sugar and fat are found in the blood, and thus, by the process of alimentation, the substances have been disintegrated and assimilated to our body.

You are astonished, my friend, because in the celestial world, where I have lived five terrestrial years, I still remember all these material terms, and condescend thus to employ them. The souvenirs that I brought from Earth have by no means faded, and as we happened to talk of a point in organic physiology, I am not ashamed to call things by their names.

If, then, we suppose that, instead of being combined or mingled with solid or liquid bodies, aliments are in the atmosphere, in a gaseous state, we create, in that way, nutritive atmospheres, which enable us to dispense with digestion and its gross and ridiculous processes.

What man can imagine, in the narrow limits of his observation, Nature has known how to realize in some part of the universe.

I assure you, moreover, that any one not accustomed to this material operation of taking nourishment through the intestinal tube, cannot fail to be struck by its grossness. This thought came to me, a few days ago, when, letting my eyes dwell on one of the richest landscapes of your planet, I was attracted by the gentle and quite angelic beauty of a young girl reclining in a gondola that floated slowly on the blue waves of the Bosphorus, before Constantinople. Cushions of red velvet, embroidered with silk of brilliant colors, formed the couch of this young Circassian; its heavy golden tassels fell even to the water. Before her, a little black slave, kneeling, played on a stringed instrument. Her body was so young and so graceful, the arm she leaned upon was so shapely, the eyes were so pure and innocent, and the brow, already thoughtful, was so calm in the light of the heavens, that I suffered myself for a minute to be captivated by a sort of retrospective admiration for this masterpiece of animated nature. Well, while this whiteness of dawning youth, this sweetness of a flower half-opened to the first rays of life, held me with a kind of fleeting charm, the boat touched a platform, and the young girl, supported by the slave, took a seat on a divan, near a table liberally spread, around which other persons had already gathered. She began to eat! Yes, *she ate*. For an hour, perhaps, I could scarcely believe the evidence of my terrestrial recollection. What a ridiculous sight! Such a being putting eatables into her mouth, and at brief intervals pouring something — I don't know what — into the interior of

her beautiful body! What grossness! Then the bits of some animal, that her pearly teeth were bold enough to munch! And then bits of another animal which saw those virgin lips unhesitatingly open to receive and engulf them! What a diet! A mess of ingredients taken from cattle, or creatures that had lived in the mud, and just now slaughtered. Horrible! I turned my eyes sorrowfully from this strange contrast, and raised them to Jupiter, where humanity is not reduced to such humiliating necessities.

The floating beings of Andromeda, where my antepenultimate life was passed, are bound, even more slavishly than the people of the Earth, to the drudgery of nutrition. They have no air that supplies three-quarters of their nourishment, as on your globe; they must get what may be called their oxygen, and they are compelled incessantly to exercise their lungs, and to prepare nutritious air, never sleeping, and never sated with air, because, with their best efforts, they can absorb but little at a time. Thus they pass their whole life, and die conquered by pain.

INQUIRER. It would be better not to be born.

LUMEN. The same reflection is applicable to the Earth. What is the good of being born, of fatiguing one's self with a thousand labors, of turning for sixty or a hundred years in the same daily round; sleeping, eating, acting, speaking, erring, running, fretting, dreaming, etc. What is the good of all this? Would not one be as well off, dying the day after one's birth, or better still, if one hadn't the trouble of being born?

Nature would go on none the worse for it, and would not notice it. And, moreover, it may be added, of what use is Nature herself, and why does the universe exist? To all these questions the thoughtful mind can give but one answer: all destinies must be fulfilled.

Often, my friend, I have asked these unanswerable questions in my inmost soul, and I remember that one truly superior person, whom I had known in a former life — in fact in the world of Andromeda, and whom I had seen again with pleasure, but too briefly, on the Earth — the virtuous princess Carolath, whom you too knew, — often talked with me about them. She tried to elevate the intelligence of the country at whose head she shone, but had small success. The people of Andromeda are very gross, and did not comprehend her teachings.

To illustrate the intellectual feebleness of this people, I will choose two subjects which generally measure the worth of a nation, — religion and politics. Now, in religion, instead of seeing God in Nature, of basing their belief on knowledge, of longing for truth, of using their eyes to see, and their reason to comprehend, in a word, instead of building their philosophy on a knowledge as exact as possible of the divine order that rules the world, they were divided into wilfully blind sects; thought they worshipped their false God by ceasing to use their reason, and that they praised Him by maintaining that their world is alone in space, by pouring forth words, by mutual injuries, sect of sect, and, alas! by blessing the sword, by lighting funeral-piles, and by

permitting wars and massacres. There are some propositions in their doctrine that seem to have been devised expressly to outrage common sense. These are the very ones that constitute the articles of faith in their creeds.

It is the same with their politics. The most intelligent and pure among them, cannot get a hearing ; so that the republic there seems a form of unrealizable government. As far back as their history can be traced, it is found that these people, cowardly and indifferent, choose to be led by individuals who call themselves kings, rather than to govern themselves. Their chief takes from them three-quarters of their resources, keeps for himself and his family the wisest essence of the atmosphere (that is, the best in that world), numbers them all, and, from time to time, sends them to fight with the neighboring people, subject itself to a similar Basileus. Like a school of herring, they swarm from two directions to a battle-field, which they call the field of honor, and massacre each other like furious madmen ; knowing not why, and not even understanding each other, since they do not speak the same language. Some, by good fortune, return. Do you think they bring back with them hatred of the Basileus? Not at all. Regaining their unsettled homes, the relics of the army are eager to celebrate, in the company of dignitaries of their sect, the acts of grace, praying their God to give long life and happiness to the worthy man who calls himself their paternal king.

INQUIRER. I infer, from your account, that the in-

habitants of δ of Andromeda are physically and intellectually very inferior to us; for on Earth we are far from leading such a life. In fine, in that world there is nothing but an animated, unstable kingdom, restless and sleepless, given up, by an inexorable fate, to perpetual disturbance. Such a world seems very strange to me.

LUMEN. What would you say of that in which I lived fifteen hundred years ago? A world also under a single rule, not unsettled, but fixed, like your vegetable kingdom.

INQUIRER. Men and animals held by roots?

III.

LUMEN. My life, next previous to that in the world of Andromeda, was passed on the planet Venus, a neighbor of our Earth, where I remember I was a woman. So I have not reviewed it directly by the law of light, since light occupies the same time in going from the Earth, or Venus to Capella, and therefore, looking at Venus, I saw her just as she was seventy-two years, and not nine hundred years, ago, when I lived in that planet.

My fourth life anterior to my earthly existence, was spent on an immense annular planet belonging to the constellation Cygnus, and situated in the Zone of the

Milky Way. This strange world is inhabited only by trees.

INQUIRER. You mean that there is nothing there but plants, — no animals, no intelligent, speaking creatures?

LUMEN. None at all. There's nothing but plants, surely. But in this vast world of plants, there are vegetable races far in advance of those on the Earth; plants that live like you and me, that feel, think, reason, and speak.

INQUIRER. Impossible! Oh, pardon me! I meant to say, that is extraordinary, incomprehensible, and unheard of.

LUMEN. So surely do these vegetable races exist, that I belonged to one of them myself, fifteen centuries ago, when I was a reasoning tree.

INQUIRER. But how can a plant reason without a brain, or speak without a tongue?

LUMEN. Tell me, I beg, by what subtle process your brain gives birth to intellectual ideas, and by what movement your soul renders its mute thoughts into audible words?

INQUIRER. . . . I seek, Master; but I do not find a full explanation of this fact, common though it is.

LUMEN. We have no right to pronounce an unknown fact impossible, when we are ignorant of the law of its peculiar mode of being. Because the brain is the terrestrial organ placed on Earth in the service of intelligence, do you think that there are analogous brains, cerebella, and spinal marrows in all the worlds of the universe? This would be too sheer an error. The law

of progress controls the vital system in each of the worlds. This system differs according to the inner nature and forces peculiar to each world. When it is sufficiently elevated to be fit to serve the system of the moral world, the mind, more or less developed, appears. Do not think that the eternal Father directly created a race in every world. No. The first stage in the animal kingdom receives human transfiguration by the very force of things, by the natural law which ennobles it, as soon as it has grown to a state of relative superiority.

Do you know why you have a breast, a stomach, two legs and two arms, and a head furnished with the senses of sight, hearing and smell? It is because the quadrupeds, the mammifers that preceded man on the Earth, were thus constituted. Apes, dogs, lions, bears, horses, oxen, tigers, cats, etc., and before them the rhinoceros thigorynus, the hyena of the caves, the huge stag of the forests, the mastodon, the opossum, etc., and before these, the plesiosaurus, the ichthyosaurus, the iguanodon, the pterodactyle, etc., and before these, the tortoises, the crustacea, etc., were the product of vital forces operating on the Earth, dependent on the state of the soil and the atmosphere, on inorganic chemistry, on the quantity of heat and terrestrial gravity. The animal kingdom on Earth has followed from its beginning this continuous forward march toward the perfection of the type-form of the mammifers, ridding itself gradually of its grossness of matter. The man is more beautiful than the horse, the horse than the

bear, the bear than the tortoise. A similar law rules in the vegetable kingdom. Coarse, heavy vegetables, leafless and flowerless, began the series. Then in the lapse of ages, the forms became more elegant and pure. Leaves put forth, clothing the woods with silent shades. Flowers came in their turn to beautify the garden of the Earth, and shed sweet perfumes through the hitherto savorless atmosphere. This double progressive series of the two kingdoms is seen to-day in tertiary, secondary, and primary soils questioned by the scrutinizing eye of geology.

There was one time on the Earth, when some islands hardly peered above the surface of the warm waters, in the profuse vapors of a surcharged atmosphere, having no creatures on them that could be distinguished from the inorganic kingdom, except some long filaments hanging in the water. Algæ and fucus were the first vegetables. We see creatures formed on the rocks that the intelligence is puzzled to name. These sponges swell. Here a tree of coral lifts itself. Farther on, medusæ detach themselves like hemispheres of gelatine. Are these animals? Are they plants? Science makes no answer. They are animal-plants, — zoöphytes.

But life does not remain fixed in these forms. There are creatures not less primitive, and quite as simple, which mark the decision of a kind of special life. These are annulates, maggots, fishes in the form of a tube, creatures without eyes, ears, blood, nerves or

will, — vegetable species, yet endowed with the power of locomotion.

Later, rudimentary organs of sight appear, rudimentary organs of locomotion, — rudiments of a freer life. Fishes and amphibia come next. The animal kingdom of the Earth is forming itself.

What would have happened if the first creature had not quitted his rock? if these primitive elements of terrestrial life had remained fixed as they were formed, and if, for some reason, the faculty of locomotion had not made a beginning?

This would have happened: the vital system of the Earth, instead of developing itself in two different directions, — through the world of plants and the world of animals, would have confined its development to the first. There would have been but one kingdom, instead of two. And creative progress, operating in this kingdom as it operated in the animal kingdom, would not have stopped at the making of feeling things, the higher plants, which are now endowed with a regular nervous system; it would not have stopped at the making of flowers, already so nearly kin to us in their organic acts; but ever going higher, would have produced in the vegetable kingdom whatever has been produced in the animal kingdom. Even now there are vegetables that feel and act; there would have been vegetables that thought and made themselves understood. The Earth would not on this account have been deprived of the human race; only the human race,

instead of being locomotive as it is, would have been held motionless by its feet.

Such is the state of the annular world that I lived in fifteen hundred years ago, in the bosom of the Milky Way.

INQUIRER. Positively, this world of Men-Plants amazes me more than the one next before it. But I can hardly figure to myself the life and customs of these strange creatures.

LUMEN. Their mode of life is indeed very different from ours. They do not build cities, they do not make journeys, or have any form of government. They know nothing of war,—that scourge of terrestrial humanity, and have none of that national pride which you possess. Prudent, patient, and constant, they have neither the mobility nor the fragility of the men of Earth. They may be seen there, at an average age of five or six centuries, living calmly, sweetly, uniformly, and without changes. But don't think that these Men-Plants lead a merely vegetable life. On the contrary, their life is very personal, very absolute. They are divided, not by caste, according to birth or wealth, as on Earth—which is absurd—but by families, whose natural rank differs according to species. They have a social history, not written, for nothing can be lost among them, as emigration and invasion are unknown, but by tradition and descent. Every one knows the history of his race. There are two sexes, as upon Earth, and unions are effected in a similar fashion, but purer, more unselfish, and always happy.

These are not always consanguineous unions, because procreation is accomplished from a distance.

INQUIRER. But how can they communicate their thoughts, if it be true that they think? and besides, master, how did you recognize yourself in this strange world?

LUMEN. One answer will suffice for your two questions. As I gazed upon this ring of the constellation of Cygnus, the eyes of my spirit clung to it persistently. I was surprised to see nothing but vegetables on its surface, and I especially noticed their odd grouping in the fields: here two by two, there three by three, still farther, ten by ten, elsewhere still larger numbers. I saw some that seemed to be sitting by the margin of a fountain, others apparently lying down, with little shoots around them. I tried to recognize the terrestrial species, such as firs, oaks, poplars, willows, but I could not detect these botanic forms. At last I fixed my eyes steadily on a vegetable shaped like a fig-tree, leafless and fruitless, but with scarlet flowers, when suddenly I saw it put forth a branch, like a gigantic arm, bring the end of this arm toward its head, detach one of the magnificent flowers that adorned its hair, and present it, with a bow, to another fig-tree of slender and elegant shape, and bearing pale blue flowers, that stood at some distance. The latter seemed to receive the flower with pleasure, for it stretched out a branch—or I might say, a cordial hand—to its neighbor, and they seemed to stand thus, hand in hand, for some time.

You know that in some circumstances even a gesture enables you to recognize a person. So it was with me witnessing this scene. The gesture of the fig-tree of the Milky Way aroused in my heart a whole world of souvenirs. This Man-Plant was *I* again, fifteen hundred years ago, and in the fig-trees, with violet flowers around me, I recognized my own children, for I remembered that the color of descendant flowers results from a mixture of the two colors of the father and mother.

These Man-Plants see, hear, and speak, without eyes, ears, or larynx. Even on Earth you have flowers which evidently know the difference not only between night and day, but also between the hours of the day, know the height of the sun above the horizon, a clear sky from a cloudy one; which, moreover, feel certain sounds with exquisite sensibility; which, in fine, understand one another perfectly, and even the messenger butterflies. These rudiments are developed to a real degree of civilization in the world of which I am telling you, and these creatures are as complete in their kind as are you of Earth in yours. Their intelligence, it is true, is lower than the average of humanity on Earth; but in their manners and mutual relations, they display in all things a gentleness and delicacy which might serve as models to most terrestrial inhabitants.

INQUIRER. Master, how is it possible for them to see without eyes and hear without ears?

LUMEN. You will no longer wonder, my old friend, if you remember that light and sound are merely two

modes of motion. To appreciate either of them one must possess an apparatus in harmony with it, though it be only a simple nerve. The eye and ear are apparatus for your terrestrial nature. In another natural organization the optic nerve, like the auditory nerve, is quite another organ. Besides, these two modes of motion are not the only ones in nature, — the luminous and the sonorous; I may even say that these titles spring rather from our manner of feeling than from reality. There are in Nature not one, but ten, twenty, a hundred, a thousand different modes of motion. On the Earth you are formed to appreciate mainly those two, which constitute almost exclusively your life of relation. In other worlds there are other senses for the appreciation of Nature under other aspects, — some of which answer to your eyes and ears, while others are occupied with perceptions wholly different from those possible to terrestrial organisms.

INQUIRER. When you spoke just now of the Men-Plants of the world of Cygnus, I thought of asking you if terrestrial plants had souls.

LUMEN. Without doubt. Terrestrial plants have souls as well as animals and men. Without a potential soul no organization could exist. The form of a vegetable depends on its soul. Why will an acorn and a cling-stone planted side by side in the same soil, in the same exposure, and exactly the same condition, produce, the one an oak, and the other a peach-tree? Because the organic force resident in the oak will construct its peculiar vegetable, and another force, another

soul, resident in the peach-tree, will draw to it different elements to form its own body ; just as the human soul will mould its own body, using the means supplied to it by terrestrial nature. Only the soul of the plant has no self-consciousness.

The souls of vegetables, of animals, and of men are already beings which have attained a degree of personality, and of sufficient authority to bend to their will, to dominate and rule the other non-personal forces that lie in the bosom of vast Nature. The human monad, for example, superior to the monads of salt, of carbon and oxygen, absorbs and incorporates them in its work. Our human soul in our terrestrial body, on the Earth, unconsciously rules a whole world of elementary souls which are the constituents of its body. Matter is not a substance absolutely solid and extended. It is a congregation of force-centres. Substance is of no importance. Between one atom and another there is a void, immense in proportion to their dimensions. At the head of the several constituent force-centres which make up the human body, the human soul governs all the ganglionic souls that are subordinate to it. . . .

INQUIRER. I confess, my wise teacher, I do not clearly comprehend this theory.

LUMEN. Then it shall be illustrated by an example that will make it pass with you for a fact.

INQUIRER. For a fact? Are you then the Princess Schezarade, reincarnated, and have you fascinated me with a new narration of the Thousand and One Nights?

IV.

LUMEN. Before I was a *thinking tree*, fifteen centuries ago, on the annular world of the constellation of Cygnus, I was, about twenty-four hundred years ago, an inhabitant of the system θ of Orion. You know, and have often admired with me, that constellation. The star θ is below the Sword and the Baldrick, and shines on the edge of the famous nebula. It is much nearer the celestial regions where we are than that nebula plunged in the remoteness of the heavens. Its light crosses the distance that separates it from Capella—always my point of observation, and the point around which this conversation revolves—in twenty-four hundred years.

This system of θ of Orion is one of the strangest in the whole casket of celestial diamonds, various as they are. It is composed of four principal suns, arranged in a quadrilateral. Two of them, forming what may be called the base, are, besides, attended, one by one sun, the other by two. It is, then, a system of seven suns, around each of which inhabited planets gravitate.

I was then on a planet which revolves around one of the secondary suns. This latter revolves around one of the principal suns, which, in its turn, with the others, revolves around an invisible centre of gravity within the quadrilateral. I will not dwell upon these movements; the *Mécanique Celeste* has explained them. So I was lighted and warmed on my planet by seven

suns at once; one larger and apparently more fiery than the six others, because it was nearest to me; a second, very large and equally brilliant; three of middle size, and two little twins. My principal sun was indigo-blue; my second orange-yellow; my three little ones white; and the last two looked like two ruby eyes.

INQUIRER. What? There are such colored suns in the heavens double and multiple!

LUMEN. Very many. The system in question is known, with others, to the astronomers of Earth, who now reckon by millions in their catalogues the systems of double, multiple, and colored stars. You can examine it yourself with a telescope.

Now on the planet of Orion, that I just mentioned, the creatures are neither vegetable nor animal. They cannot be classed under any head of terrestrial life, or even in either of the two grand divisions,—animal and vegetable. I don't know what I can liken them to in order to give you an idea of their form.

Did you ever see in the Botanical Gardens the gigantic mullen, — *cereus giganteus*?

INQUIRER. I know it very well. It received its name from its resemblance to the wax-tapers with three or four branches that are burned in the temples.

LUMEN. Well, the men of θ of Orion have a somewhat similar form. Only they move slowly and hold themselves erect by a process of suction, like bladders. The lower part of their stem, which touches the Earth, feebly stretches out, like the finger-fish, little

appendices, which fix themselves in the soil, making a vacuum. These creatures often move in bands, and change their latitude according to the season.

But notice the most curious feature of their organism, which proves what I said just now about the reunion of elementary souls in the human body.

Having looked over this world, where I had lived twenty-four hundred years ago, and whose light occupies an equal time in reaching me here, I recognized myself in one of these creatures. I saw myself standing erect in an Orionic landscape. I looked at myself, recalling the long past time when I lived in this world. I was then like a vegetable ten metres high, with neither leaves nor flowers, mainly composed of a cylindrical stem terminating in its upper part in many branches, like those of a chandelier. The diameter of the central stem, and that of the branches, must have measured a foot; the top of the stem and the branches was crowned with a diadem of silvery fringe.

Suddenly I saw this creature shake its branches and vanish.

Then I remembered. In that world persons in very good health are often seen to fall together, literally all in pièces.

The molecules of which they are made, drop all at once to the ground. The individual ceases to exist as a personality. His molecules are scattered on the surface of the soil.

INQUIRER. They segregate and play truant?

LUMEN. Pretty much. I remembered that this decom-

position of the body often happens during life. Sometimes it results from contrariety, sometimes from fatigue of the members, sometimes from an organic discord between the several parts. They exist as integers, such as you are, and suddenly find themselves reduced to their lowest terms. The cerebral molecule, which is your essence, is conscious of falling in consequence of the fall of its sisters, the whole length of the limbs, and reaches the ground, alone and independent.

INQUIRER. This mode of evanishment would sometimes be very convenient here on earth. To escape from an embarrassing situation, — for instance, from a conjugal scene *à la* Molière, or a bad quarter of an hour like Rabelais's, or from such a dreadful blind alley as a gangway, or a scaffold, one need only dismiss one's constituent atoms, and by-by, gentlemen!

LUMEN. You make a joke of it; but I assure you it is an incontestable fact. It would be a fact on Earth, as well as on the planet of Orion, if the principle of authority were not so strong with you. It is an elementary fact there now. Your body is composed of animated molecules. Your spinal marrow, according to one of your eminent physiologists, is a linear series of centres at once independent and controlled. The essential constituent parts of your blood, your skin, and your bones, are in like case. They are provinces which have an autonomic administration, but are subject to a superior authority.

The operation of this authority is a condition of human life, which is less exclusive in the case of inferior

animals. Under each ring of the earth-worm, there is a complete worm, so that an earth-worm represents a series of like creatures constituting a real society of vital coöperation. Cut up into rings, the worm becomes so many independent individuals. In the tape-worm, the head is far more important than the other parts of the creature, and, like plants, possesses the power of reproducing the rest of the body of which it has been divested. The leech also is formed of welded individuals. If one be cut into five rings, as many leeches result. In the same way a branch shoots out again from a tree, and a crab's claw and a lizard's tail are restored. In fact, vertebrate animals, — such as man, for instance, are composed in their essential shaft (the spinal marrow and its higher expansion at the brain) of segments placed together, of nervous centres, each one of which has an elementary soul.

The law of sovereignty in operation on the Earth has ordained a prevailing tendency in the animal series. You are composed of a multitude of beings grouped together and dominated by the plastic attraction of your personal soul, which, from the centre of being, has formed your body from the embryo, and has united around it, in its microcosm, a whole world of creatures not conscious as yet of their individuality.

INQUIRER. Is Nature, then, an absolute republic on this planet of Orion?

LUMEN. A republic governed by law.

INQUIRER. But when a creature is thus decomposed, how can he afterwards reintegrate himself?

LUMEN. By force of his will, and often without the slightest effort, and even by a secret desire. Though separated from the cerebral molecule, the corporeal molecules are no less closely connected with it forever. At a given moment they reunite and resume their places. The directing molecule attracts the others from a distance, as the magnet attracts iron-filings.

INQUIRER. I think I can see this Lilliputian army surprised by a hiss, and falling back on its centre, reform the little soldiers, who, climbing nimbly upon one another, in the twinkling of an eye, reconstruct the Man-Mullen that you described. Indeed, one has to leave the Earth in order to see such novelties.

LUMEN. So you judge of universal Nature by the atom under your eyes, and are quick to comprehend only those facts that come within the sphere of your observation. But, I tell you again, the Earth is not the type of the universe.

This world of θ of Orion, with its seven revolving suns, is populated by an organic system like that I have just described. I lived there twenty-four hundred years ago, and I again see myself there at a distance of time equal to the period occupied by light in passing to this point from Capella. I know there a spirit who, in the present century, is incarnated on Earth, and publishes his investigations under the name of Allan-Kardec. In our terrestrial life we did not recall our former acquaintance; yet we sometimes felt drawn to one another by strange sympathies of thought. Now that he has, like myself, returned into the world of spirits, he

also can remember the strange republic of Orion, and can see it again. Yes, very strange, yet real. You have no idea, on your poor planet, of the unimaginable diversity which distinguishes the worlds, in their geology as markedly as in their organic physiology. These conversations may serve to enlighten you as to the general fact, so important in a conception of the universe.

But their peculiar scientific service will have been to teach you that light is the medium through which universal history is transmitted. With the powerful eyesight that we possess here, we can scan the surface of distant worlds. The eye of our spirit is not the same as the bodily eye. Into the latter the rays converge, so that a very small object placed very near the eye fills the interval between two rays, while at a greater distance a larger object is necessary to fill the proportionably magnified space which separates the same rays. Into the spirit's eye, on the contrary, the visual rays enter in parallel lines, so that we see every object in its actual proportion and its normal size, its apparent magnitude being in nowise affected by the distance. We see certain large objects, as whales, only in sections proportioned to the opening of our own retina, and these parts are visible by us with the same clearness at any distance (since we have no atmosphere to veil the distance), and a tree on a prairie in a heavenly body as far away as Orion is from Capella, is distinctly seen by us.

Moreover, according to the law of the successive

transmission of light, all the events of Nature, the history of all the worlds, are spread out in space, like the universal picture, the truest and grandest, of all Nature.

The dawn approaches, which puts spirits to flight, and will make our conversation vanish as the radiance of Venus vanishes at the coming of morning light. I should like to add to what I have said a very interesting reflection suggested by the same observations. It is this: If you started from the Earth simultaneously with a flash of lightning, and moved an hour or more with the speed of light, you would see the flash as long as you looked at it. This point is settled by the principles explained above. But if you moved not *exactly* with the speed of light, but a little less rapidly, this is what you would observe: Suppose that the journey from the Earth, during which you look at the flash, lasts one minute—suppose that the flash lasts the thousandth part of a second—you would have continued to see the flash for a period equal to 60,000 times its duration. According to our first supposition, this journey is the same as that of the light. Light occupies 60,000 tenths of a second in going from the Earth to that point in space where you are; its journey and yours are coincident. Now if, instead of moving with exactly the same speed as light, you had moved a little less rapidly—had, for instance, taken a thousandth of a second more in reaching the same point—instead of seeing always the *same instant of the flash*, you would have seen successively the several

periods which make up the whole duration of the flash, equal to the thousandth of a second. In this whole time you would have been able to see from the very beginning of the flash, to analyze its development, its phases, its sequel, even to the end. What strange discoveries could be made in the recondite nature of a flash of lightning magnified in duration 60,000 times! What fearful battles you would have time to see in its flames! What a pandemonium! What collisions of atoms! What a world now hidden by its very fugacity from the imperfect vision of mortals!

Travelling with the speed of light, you always see the tableaux which existed at the instant of your departure. If you are borne at this same speed a whole year, you have for a year the same event in sight. But if, in order better to see an event which could have occupied only a few seconds in happening, —like the fall of a mountain, an avalanche, or an earthquake, you start so as to see its beginning, and by relaxing your speed a little in comparison with that of the light, so as not to see this beginning continually, but presently the first minute that followed it, then the second, and so on, so as not to see the end till after an hour's looking, nearly following the light: the event is to you an hour long instead of some seconds. You see the cliffs or rocks suspended in mid-air, and you can give an account of the processes of the phenomenon and of its diminishing vehemence.

I see that you mentally compare this proceeding to a microscope which could magnify time. That is just

it. We thus see time amplified. This process cannot strictly be called microscopic, but rather chronoscopic, seeing time from afar.

The duration of a kingdom can, by the same process, be prolonged according to the will of a political party. Thus Napoleon II. having reigned only three hours, one might see him reign fifteen years *successively*, by dispersing the 180 minutes which make the three hours to the extent of 180 months, by proceeding from the Earth with a speed a little less than that of light; so that departing the first minute after the Chambers acknowledged Napoleon II., one reaches the end of his imagined reign, only at the end of fifteen years. Each minute would be seen a whole month; each second twelve hours.

The conclusion of this discourse, my dear Inquirer, is embodied in this principle. I would show you that the physical law of the *successive transmission of light* into space is one of the *fundamental elements of the condition of eternal life*. Under this law every event is imperishable, and the past is always present. The image of the Earth of six thousand years ago is actually existent in space at the distance traversed by light in six thousand years; the worlds of that region see the Earth of that date. We can directly review our own life, and our several *anterior lives*; in order to do this we need only be at a suitable distance from the worlds where we lived. There are stars seen from the Earth, yet non-existent, — extinguished after emitting the luminous rays that have just reached you;

just as you could hear the voice of a man a long distance away, who might be dead before it reached you, if he had been, for instance, stricken by apoplexy after he had spoken.

I am glad that this outline has permitted me to show you at once the diversity of these existences, and the *possibility of living forms that are unknown on Earth*. Here, too, the revelations of Urania are more grand and profound than those of all her sisters. *The Earth is but an atom in the Universe*.

I pause there: all the many and diverse applications of the laws of light were unknown to you. On the Earth in that dark cavern, so felicitously characterized by Plato, you vegetate in ignorance of the mighty forces in operation in the universe. The day will come when physical science will discover in light the principle of every motion and the hidden cause of things. Already, within a few years, spectrum analysis has shown you in a ray of light from the sun, or from a star, the substances which compose that sun or star; already you can declare at a distance of millions or trillions of leagues, the nature of the heavenly bodies whose luminous rays come to you! The study of light prepares you for results still more magnificent, both in experimental science, and its application to the philosophy of the universe.

As these conversations have shown you, I have travelled in many celestial countries, and am yet established, incarnated, nowhere. I hope, in the course of centuries, to be incarnated in a world be-

longing to the retinue of Sirius. Humanity there is nobler than on Earth. Births take place after an organic fashion less ridiculous and less brutal than that of Earth ; but the most remarkable feature of the life in that world is the fact that man there perceives the physico-chemical processes which take place in the sustenance of the body. In your terrestrial organism you do not see, for instance, how the absorbed aliment is assimilated, how the blood, tissues, and bones are renewed ; all these functions are discharged instinctively, unperceived by thought. Thus a thousand maladies are endured, whose origin is hidden and often undiscoverable. There man feels the processes of his vital sustenance, as you feel a pleasure or a pain. From each molecule of the body, so to speak, proceeds a nerve which transmits to the brain the different impressions it receives. If terrestrial man had such a nervous system, scrutinizing his organism by the aid of the nerves, he would see how food is converted into chyle, that into blood, the blood into bile, saliva, nervous matter, etc. ; he would see himself. But you are far from that ability, the animic centre of your perceptions being encumbered by the many nerves of the cerebral lobes and optic membranes.

Another important characteristic of vital organization in the Sirien world is the power of the soul to change bodies, without the intervention, often painful, and always sad, of death. A wise man who has spent his whole life in teaching his kind, and sees the end of his days approaching, with his noble enterprise un-

finished, can change bodies with a young man, and begin a new life more useful than the first. Nothing is necessary for this transformation, save the assent of the young man, and the magnetic operation of a skilful physician. Sometimes, also, two beings united by the tender and strong bonds of love, effect such an exchange of bodies after a union of many years; the husband's soul takes possession of the wife's body, and *vice versa*, for the rest of life. Knowledge of life becomes incomparably more minute and complete to each of them. The system of Sirius is superior to this, and I hope to spend in it my next corporeal existence.

It is not my purpose to inform you about the worlds that I shall inhabit; only to acquaint you with those that I have lived in. From these you can see the immeasurable diversity between the living creatures of all the solar systems scattered through space.

Accompanying me in spirit in this intersidereal journey, you have spent several hours far from the Earth. It is well to seclude one's self sometimes in the celestial paths. The soul knows itself better, and in its solitary thoughts, penetrates deeply into the realities of the universe. Terrestrial humanity is, you know, morally and physically, the result of actual forces of the Earth. The human form, shape, and weight, depend on these forces. The organic functions are determined by the planet. If life here is a season of toil or rest, of activity or slumber, this character is due to the rotation of the globe and the night; in the

luminous globes, or those illuminated by several alternate suns, there is no sleep. We eat and drink here, because of the imperfect condition of the atmosphere. The bodies of creatures that do not eat, are not constructed like yours, since they need no stomach or abdomen. The terrestrial eye enables you to see the universe in a certain fashion; the Saturnian eye sees it in another way: there are senses that perceive things that you perceive not, and which see not what you see in Nature. Every world is peopled by essentially different races, and which are, sometimes, neither animal nor vegetable. There are men of all possible forms, sizes, weights, colors, sensations and characters. The universe is an infinity. Our earthly life is but a phase of infinity. An inexhaustible diversity enriches the wonderful fields of the eternal Sower.

The office of science is to study what terrestrial powers are able to compass. That of philosophy is to form a synthesis of all ideas limited and determined, and to develop the sphere of thought. Now, my dear terrestrial friend, you know what the Earth is to the universe, you know elementarily what Heaven is, and you know also what Life is, and what is Death. . . .

But the refraction of the terrestrial atmosphere spreads beyond the zenith the light of the distant sun. The vibrations of day forbid me to talk longer with you. Adieu, my worthy friend! Adieu: or rather *au revoir!* Great events are going to happen around you. After the tempest, perhaps I shall return to give you a sign that I still live, to show that I do not forget you.

Later, when you have ceased to live on this poor world, I shall come to you, and together we will journey through the indescribable splendors of immensity. In the most daring dreams of your imagination, you can never have formed even an approximate idea of the amazing curiosities, the unimaginable marvels, that await you.

II. HISTORY OF A COMET.

PREFACE.

THE story that follows is not a romance of pure fancy, grown spontaneously in the too fertile fields of the imagination; it belongs wholly, and by right of birth,* to positive studies; it was born on scientific soil.

The Comet to be introduced, and that will furnish us the materials of our narrative, is not a myth; it exists; and millions of persons have seen it shining over their heads, as will be shown at the end.

The dates of its apparitions have not been arbitrarily imagined, but calculated by elliptic elements worthy of the full confidence of reasonable men; these elements are known to astronomers, and the limit of possible error does not amount to more than an hundredth part.*

*Astronomers will know what comet is meant, if we tell them that its elements are as follows:

$$\begin{array}{ll} T = 1811, \text{ Sept. } 12, 26. & i = 73^{\circ} 2' 43''. \\ \pi = 75^{\circ} 1' 0''. & q = 1.03558. \\ \Omega = 140^{\circ} 24' 26''. \end{array}$$

We may add that its aphelion = 421.02; the half of its grand axis, 211.03; its eccentricity, 0.9951; and that the direction of its motion is retrograde.

The character of the regions visited by our daring traveller is not arbitrarily determined, but is, on the contrary, based on direct observation or on induction.

Not one — not even the smallest, of the phenomena described — has been frivolously invented. The language is not permitted to wander at random, but remains the humble servant of its august mistress, Truth.

Such is the substantial woof of the web that we have taken pleasure in weaving for the inspection of our readers.

I.

THE COMET FIRST NOTICES THE EXISTENCE OF THE EARTH.

About the year 611,189 B. C., the great comet which the inhabitants of Jupiter had remarked for the first time, about forty million years before, first noticed, not far from the sun, a little planet about fourteen hundred times smaller than that just mentioned, — a wretched-looking globe, turning awkwardly on itself, surrounded by thick vapors, and subject to terrible geologic and atmospheric changes; in fine, uninhabitable by the human race.

This comet, whose tail was not less than eighty million leagues long, whose nucleus, not yet solid, had a circuit of ten million leagues, and whose beautiful coma was more than nine hundred thousand leagues in thick-

ness : its dimensions are even to-day half of what they were then : this comet, which, up to that time, had confined her observations to the worlds of Jupiter, Saturn, Uranus, Neptune, etc., and had moved only in the highest society of the heavens, was strangely and disagreeably surprised at the sight of this poor little world of Earth.

Though aware of the vastness of Nature's powers, she was far from suspecting that such Lilliputian stars could exist. She looked several times before she could believe her eyes, and only when she had become convinced that there was no possibility of an illusion or mirage, did she condescend to accept the fact. The existence of this contemptible social grade, magnified her in her own eyes. Clothing herself with her cometary majesty, she swept disdainfully by the poor outcast, averting her head and proudly elevating her crest ; then retracing her course, turned back into the deserts of space, and haughtily held her splendid flight through the vast heavens.

Thus, alas ! too often, the great sweep before the little, the mighty before the weak, contemptuous of humble worth, and foolishly forgetful of justice, as if creatures apparently most unlovely were not children of Mother Nature, and members of the same universal family !

Yet in fact (it must be confessed) this world of ours is a very little one to those who do not, like us, illude themselves with a notion of its importance. Our sentiments of patriotism, natural though they are, some-

what magnify its merits, and travellers in space, who see it for the first time, would scarcely suspect us of making so much of it.

This comet, one of the most beautiful, not to say magnificent, of our system, never approaches the sun at a less distance than that which separates the latter from the Earth, — 37,000,000 leagues. She moves in space in an elliptical orbit, and when she comes toward the region where we are, rapidly describes a semi-circle, and returns. The long-haired star, borne along at the rate of a million leagues per minute, remounts to the borders of the planetary kingdom, and crosses the orbits of all the worlds. As if regretting the beautiful sun with his flashing crown, she moderates her speed as she goes from him. She goes five milliards, three hundred and eighty-seven millions, eight hundred thousand and four hundred leagues from the sun; that is her aphelion; in the recesses of this obscure region her slackened speed is hardly more rapid than the wind, — a few metres per second. But her curve again contracts, and returns to the radiant star, whose disk has successively diminished in size, so that at this distance it looks like a common star. Yet even from this far wandering, the sun calls her and she knows his voice. Then she turns toward him, and from polar heights pounces on the ecliptic, carefully shunning the net that Jupiter and Saturn hold in her way; her speed is seen to increase, to become immense, prodigious, eager as passion, and then she hurls herself again toward the sun, the centre of planetary attraction. After a jour-

ney of five hundred years she reaches the splendors of her perihelion; the cone of flaming vapors that was contracted as the comet abandoned the sun, and had wholly disappeared, springs up anew and expands as she approaches the centre of the spheres. Her form swells, and she resumes her golden radiance and wealth of ornament, just as courtiers put on their festal garments before entering the presence of the king. This is because the comet has entered the radiant domain of the King of Light; she displays before the amazed eyes that behold her the magnificence of her beauty and her attire.

When, in the year 608,180 before the Christian Era, the floating star returned from her journey and repassed the regions inhabited by the Earth, her attention again drawn to this little sea-green globe, could not be diverted from it. Some great folks voluntarily take an interest in little ones, by the force of contrast, and one often lets one's self be puzzled by the operation of microscopic mechanisms. So the comet deigned to look, and desired to know to what grade of life this miserable globe had attained.

Just at this time she happened to remain a whole year in sight of the Earth, and in a favorable position for observing it; but she could not, nevertheless, withhold herself from the impetus which impelled her in a contrary direction.

Instead of turning from west to east, like all the planets, and nearly all the satellites of the system, it moved from east to west, that is, in a retrograde direc-

tion. This odd law aroused, as difficulties always do, her thirst for investigation, and during the twelve months in which the Earth remained within the limit of her vision, every night and every day was devoted to inspection. She saw first, as she had suspected, that this offshoot of a world was uninhabitable by intelligent beings. It turned slowly on its axis, but the alternations of night and day had no effect on it, because it emitted from its own bosom a heat infinitely greater than that which it received from the sun. The fog, vapor, and smoke that surrounded it, had hitherto proved an obstacle to the solar rays. As the comet drew near the Earth, she tried to make out its surface more clearly; but she had never seen so poor a world, and not being able to persuade herself that a planet was so wretched, waited till a lifting of the atmosphere should permit the sun's rays to enter and illuminate the scene. This happened about the time of the solstice. Was it the winter or summer solstice? History does not tell us, especially because in that long-past time the Earth had no seasons, and by its own heat was as warm in winter as in midsummer. Whatever day it may have been, the comet could not repress a cry of astonishment, when she succeeded in seeing clearly the Earth's surface.

"A world of shells!" she exclaimed.

She was not mistaken. The Earth was then in the secondary age; the triassic rocks were forming, and appeared in the midst of the conchylilian period.

Some millions of years before this time, there had

been at first a condensation and a fall of waters on the globe, then wholly liquid ; a thousand terrible combinations of gases, vapors, and incandescent substances had furrowed the burning bosom of the just-opened sphere ; here and there Plutonian Chaos, dissolving and reconstituting the disturbed foundations of the new world, had extinguished revolutions with new revolutions ; its enormous arm had conquered the forces of the laboring furnace, only by giving the entire globe over to pasture-land. In this huge laboratory, nature was stimulated to chemical manifestations, whence resulted volcanoes with flaming throats, eruptions of lava, springs of boiling water, and geysers of steam ; later, a crust was formed on the surface of the fused globe, as a pellicle covers a crucible of cooling lead, and the convulsions began to subside.

After this epoch, during which appeared no living creature, vegetable or animal, nature rested in a transition period, a slow and majestic season, of whose age and duration no mind can form an idea ; then were accomplished the first mysteries of the generation of creatures, and among the torments and incessant disturbances of the not yet hardened surface, the first plants — algæ and fucus, the first animals — coral zoöphytes, emerged from the bosom of the all-covering sea.

Later still, the primitive marshes were seen to be covered with a vast vegetable dress, and the kingdom of plants had inaugurated its era of splendors. First master of the new globe, it had displayed all the riches

of its realm, and no other period has witnessed such an exuberance of forms or such an overwhelming predominance. Plants of extreme simplicity, devoid of flowers and fruits, yet of great size and height, had spread the radiance of their glowing verdure over all the banks and necks and peninsulas that the dominating waters had left to Earth. It was like a great sea, dotted with green oases. The arborescent brakes, calamites, sigillaires, lepidodendrons, lomatophloiaë and equisetacæ disputed together the sovereignty of the isles. From this time dates the formation of the coal that warms us to-day, vast vegetable beds that restore to the light trunks buried in the tomb of vanished ages; these mines were founded a million years before the period when our history begins. From this date the birth of terrestrial life progressed, and one could hardly say that it was yet born.

Approaching the globe, the comet had seen nothing but shells. With the best intentions possible, she could have seen nothing else. The sea ruled over the whole surface of the globe, as it rules, to-day, over three parts of it; there were no continents, only islands and swamps. The king of the creation was then a kind of sea-snail, a cephalopod mollusk, rather noisy and quite harmless.

This innocent creature, who never thought of being one day baptized by Jupiter Ammon, then reigned, a sovereign, in the kingdom of Neptune.

“The trident of Neptune is the sceptre of the world,”

Lemierre says. No Englishman could claim this sceptre with so clear a right as the little animals just mentioned. One saw these creatures, like the nautilus of our day, floating on the surface of the waters, with their white or many-colored nacelles, big, little, and middle-sized, and of all shapes: whole fleets sailed in search of marine prey. One saw them running with grace and speed, crossing and passing each other, just as if they were taking part in a regatta. *One* saw them — this one means the comet, for there was no other spectator to enjoy that ancient sight; solitude and silence.

“There was heard afar on the waters and under the skies
Only the sound of rowers in harmony striking
Harmonious waves.”

And these rowers were none other than our ammonites, travelling at will on the ocean and the seas.

Our comet, surprised enough at seeing only shells on the sea and shells on the Earth, nothing but shells everywhere, wore herself out in the effort to conjecture the reason for the creation of the terrestrial globe. “’Tis a great mystery,” she said to herself, “that a world should be made to be inhabited only by such things.” She inquired what amount of intelligence could be enclosed in the heads of these creatures who had no head, what degree of judgment they possessed, and what was the power of their thought; and despite the meanness and insignificance of the terrestrial globe, she could not make up her mind that this little universe had been created expressly as a home for these mol-

lusk. She scrutinized all their kinds. She remarked the sociableness of the muscles and the cleverness of the turtles that had just awoke to life ; she looked at the acephalous mollusks, the gasteropods, brachiopods, pteropods, and cephalopods, as well as the cirripetes, with neither head, nor feet, nor arms ; but in the whole company found no individual that she could accredit with the precious faculty of intelligence.

Wearied by this fruitless investigation, the comet turned away, and like the Wandering Jew of the future, thought as she went, and went as she thought, when a guttural and frightful cry shook the echoes of the world : “ Ah,” she said to herself, “ that, doubtless, is the prince of the creation ; I thank Heaven for not having let me go without seeing him.” She turned her head : it was indeed he.

A shapeless, blackish, huge, rough monster, displaying the enormous throat of a crocodile joined to the neck of a hippopotamus, with short fore legs and hind legs as big as a camel’s, was dragging itself grotesquely to the brink of a swamp.

“ He is not handsome,” she continued ; “ but beauty is simply a matter of taste, an estimate wholly relative, and with nothing absolute about it. This must be the Prince of the land (in the kingdom of the blind, the one-eyed man is king), and the ammonites are the princesses of the sea. He seems to live mainly in the country, and does not stand for good manners. He is simple, modest, and ugly ; in a word, quite suited to the world he lives in. All right : I did not suspect

that such creatures existed; but it can't be gainsaid, — this labyrinthian is the only animal with strength enough to hold the sceptre; therefore he is the king. Behold the first of majesties! Might takes the lead of Right." She continued her monologue by a discussion of the Darwinian theory of "natural selection," from which it results that "the claim of the strongest is always the best."

Diverted, in a measure, from her usual habits by the apparition of this terrestrial monster, the comet pursued her return journey, meditating, and approached the limits of the planetary system, without noticing the rapidity of her progress, or the spheres that she encountered on her road. She awoke to a consciousness of existence only when she was approaching Saturn.

The splendor and opulence of a civilization perfected by ages of toil surrounded this world with radiance. It was the abode of fruitfulness and peace. Drawing near to it one felt that life was pulsing in its bosom. Long ago it had emerged from chaos, and was advancing slowly toward realizable perfection. As some happy mortals have learned, — those worthy to understand the genius of nature (*majestati naturæ par ingenium*), and to penetrate her august secrets, the planetary worlds hold in the figures of their distances from the sun the cryptogram of their age. The most distant are the oldest, and the most advanced in the path of progress.

Neptune, eleven hundred millions of leagues from the

sun, first emerged from a solar nebula, milliards of centuries ago. Uranus, which revolves at a distance of seven hundred million leagues from the common centre of planetary orbits, is many hundred million centuries old. Saturn, three hundred and fifty million leagues from the sun, bears on its venerable head the weight of more than a hundred million centuries. Jupiter, a Colossus, moving one hundred and ninety million leagues away, has reached the age of seventy million centuries. Mars's life numbers a thousand million years; its distance from the sun is fifty-six million leagues. The Earth, thirty-seven million leagues from the sun, sprang out of its bosom a hundred million years ago. It is, perhaps, only fifty million years since Venus emerged from the sun; she revolves at a distance of twenty-six million leagues away from him; and only ten million years since Mercury, fourteen million leagues away, was born of the same source; while the Moon was brought forth by the Earth.

The visitor, having witnessed all these births, knew better than any one else her history and sidereal chronology; but, like all well-informed persons, she always found means of increasing her knowledge, and spent her life in observation. Saturn, then, along whose system she was coasting, was in the zenith of prosperity. Shining and happy labor here opened the casket of her treasures. The inland seas were covered with swift ships, sovereigns of the liquid empire; harbors overflowed with the wealth of all nations. Rivers were dotted with other craft of smaller sizes, and the

fields were crossed by narrow streets lined with lordly edifices. Whole fleets sailed in the limpid air, and aerial cradles rose to the height of towers to meet the steep mountain ridges. Mind had indeed subdued matter, and man's empire extended from the bottom of the sea to the highest point of the air. Life, like an invisible woof, bound together in one heart the most distant parts of this universe. Looking at the globe from the poles, one saw a vast system of rings surrounding it; aerial ships mounted even to these. Around the central Saturnian world there was another extra-Saturnian world, separated from the first by a distance of eight million leagues, and twenty-four thousand leagues in size, but joined to the central world by an atmosphere. Beyond this second annular world eight others were seen, like little orange or green globes revolving around it. The genius of Saturnian humanity had brought this whole universe under its rule, and its power radiated from the central globe, shedding itself upon all the others.

As happens when, taking a siesta in shade of a palm overlooking the fertile life of Africa, one grows drowsy, then wakes with a start, and comes out from a gloomy dream to look upon the rich fields; so was it with the comet, when, absorbed in revery after she had left the shapeless Earth, she awoke in the presence of Saturn the magnificent. She checked her speed, and gazed more intently than ever upon that wonderful sphere, — a retardation that astronomers call “the perturbation Saturnian,” and when she had passed around the sides

of that vast empire, she really thought she had emerged from a nightmare.

What, indeed, was Earth by the side of that splendid star? Earth! a paltry little globe where life was scarcely born in unacknowledgable shapes; a chaotic mass, whose elements were in confusion, — in fine, a nothing. For the comet, having turned round, no longer saw the Earth in the distance, except as a very little black spot on the sun. This fact quite suffices to excuse the oblivion into which the Earth fell in the cometary memory, and to account for the comet's indifference toward so humble an object as the terrestrial creation.

II.

IN WHICH THE COMET MAKES COMPARISONS BETWEEN
OTHER WORLDS AND OURS, VERY UNFAVORABLE TO
THE LATTER.

The indifference of the comet toward the Earth continued so long, that she returned twenty-four times to her perihelion without thinking of casting a glance upon the little terrestrial globe; yet an end was put to this neglect by a very strange event which came almost without her knowledge, to disturb her apathy.

The twenty-fourth time she passed that way — it was about 534,564 years B.C. — she found herself for a

moment quite near the Earth, for the two stars crossed each other in their courses, so that the Earth lived five days and five nights in the vaporous tail which gave the comet a length of seventy million leagues, — this tail being measured from the head to the extremity of its floating robe. This immense caudal appendage was a hollow cone, whose sides were some hundreds of thousands leagues thick: this conical figure represents the usual shape of comets' tails; the cone is more or less bell-mouthed, and sometimes approaches a cylinder in appearance. It is an extremely tenuous atmosphere formed by the action of the sun. Heat volatilizes all parts of the comet that can be affected by it, and that had been condensed by prolonged cold during the absence of the comet from neighborhood to the central fire: these volatilized parts stretch over a vast space, become extremely light, and fly off from the body of the comet, which exerts only a feeble attraction upon them. Whatever their length, these cones do not weigh much; you could cut off a bit of one as big as Notre Dame or the Observatory, and swallow it like a whiff of air.

The Earth, we said, lived five days in this cone. It may seem strange that our planet survived such an encounter, and perhaps still more astonishing, if we add that this contiguity was unnoticed by those living at that time. What, then, can one believe about the shock of comets, and what satisfactory information do astronomers give us about it?

One of the most eminent (Laplace) thought that

comets were much heavier than the foregoing statements would show them to be. "The seas," he said, "abandoning their ancient place, to rush toward the new equator, a large part of mankind and animals was drowned in the universal deluge, or destroyed in the violent shock of the Earth; whole species were annihilated, and all the monuments of human industry overthrown; such are the disasters that the collision of a comet must have produced." "If the tail of a comet reached our atmosphere," says another (Grégory), "or if any part of the matter which composes that tail spread over the heavens, fell upon it by its own weight, the resulting effluvia would work material changes for man and plants; for it is indisputable that vapors brought from regions so distant and strange, and excited by so mighty a heat, would be deadly to everything on the Earth, and would occasion the direst calamities." "At the approach of these two bodies," says a third (Maupertuis), "great changes would inevitably take place in their movements, caused either by their mutual attraction, or by certain fluids confined within them. The least of these would be a change in the situation of the axis and poles of the Earth. The tails are, probably, huge torrents of exhalations and vapors driven out of their body by the power of the sun. A comet attended by a tail, may pass so near the Earth that we shall be drowned in the torrent that it drags after it, or in an atmosphere of like nature that surrounds it. Some, drawing near the sun, have become so heated by it, that they could not cool off in fifty

thousand years. What would be the effect of such heat on the Earth? It would be reduced to ashes or vitrified; the tail alone would deluge the Earth with a burning stream, and destroy all its inhabitants. Just as a colony of ants perishes in boiling water poured on them by the gardener."

The English Whiston was the first to ascribe the disasters of our world to comets. Having cited the comet of 1680 as the cause of the deluge, he announced that, returning from the sun, and bringing with it burning and deadly exhalations, it would bring upon the inhabitants of the Earth all the evils that are predicted for the end of the world, and finally, a universal conflagration that would consume this unfortunate planet.

But on the other hand, Newton declared that a comet without a nucleus, large enough to reach from here to Saturn, could be contained in a thimble twenty-five millimetres in diameter, if it were as condensed as is the atmospheric air that we breathe. The latest calculations as to the feeble masses of comets, ought to banish all our fears. The mightiest comet, falling on our globe, would be as ineffectual as a fly against a locomotive, and its gases could have no force against our atmosphere.

As to our antediluvian world, its inhabitants could have had nothing to fear from an inundation like that threatened above to the terrestrial ant-hill, while they drank, swam, dived, dwelt, and lived in the midst of warm water. Microscopic infusoria, fishes and amphibia were unconscious of the passage of the comet.

More than this—and here is the little event that will rouse our illustrious traveller from her ages-long apathy—the transit of the terrestrial globe not far from her head had a very favorable effect on her mind, from an earthly point of view, at least. She deigned to notice the globe that passed through her hair. One might think that the Earth, weary of long solitude, was watching for the moment of encounter, for never did the eyes of a comet see a stranger sight. Two steep rocks guarded the entrance of a peninsula; on these, hidden in clouds, two queer creatures, unheard of, marvellous, extraordinary, gazed out intently and unwinking.

They were the Pterodactyl and the Ramphorhyncus, two bats as big as sheep, two living sphynxes, whose folded wings looked like trees with long pendant leaves. Struck by the spectacle, the comet searched her memory, and recalled the fact that 63,560 years before, she had noticed this little globe and its strange inhabitants.

So she began to examine the Earth carefully: she saw at the first glance, that the geographical configuration of the surface had materially changed, that little continents cut up the all-pervading ocean, and that exuberant vegetation divided the empire of the world with an animal kingdom equally important. She next observed the typical figure embodied in this animal kingdom, and was greatly astonished. At her last visit she had seen nothing but shells; now there were crocodiles,—but crocodiles of every form, color, and variety. On the hard Earth, in the seas, in the air,

everywhere, crocodiles, lizards, saurians — some with fins and some with wings — indeed, a whole nation of crocodiles.

She cast a piercing look upon the creeks and promontories and reviewed the army of gigantic saurians. She saw defile before her eyes ichthyosaurians, the *communis*, the *intermedius*, the platyodon, the *tenuirostris*, etc., some thirty feet in length. Shoals of marine lizards swam in the open sea, like whales; they had eyes a foot long, furnished with an optical apparatus which served them at will, as microscope or telescope; they were armed with powerful jaws, which opened more than a metre, and displayed two fine rows of one hundred and eighty teeth: their vertebral column, composed of one hundred vertebræ, enabled them to make the most flexible and insidious movements. She saw troops of Plesiosaurs plunge from the shores into the water, — lizards shaped like the others, which resembled serpents in their inordinately long necks, chameleons in their sides, quadrupeds in their trunks, and whales in their fins. She saw the dreadful encounters of the terrible Pœkilopleurons, with enormous claws and sharp teeth, with the Hyleosauri, the Cetiosauri, the Stenosauri, and the Streptospondyles, — and the Teleosauri, the fillibusters of the antediluvian seas. She saw flocks of Pterodactyls dart into the air, gigantic bats, whose dreadful throats showed sixty formidable teeth, and which passed their lives in leaping from tree to tree, and from rock to rock. The huge vegetables were not less astonishing, by reason of their

savage aspect; there were great stalks, horse-tails, reed-grass, enormous brakes, cone-bearing plants that looked like our fir-trees, and slender *pandanées* with their roots in the air.

Looking at this panorama, rather doleful than pleasant, the comet reflected. Three hundred and sixty-five times the Earth turned beneath her eyes; three hundred and sixty-fives times she made in vision the entire circuit of the globe. Suddenly a frightful cracking was heard. The crust of the globe opened in the middle of the sea, and while flames shot up from laboring bowels, the water instantly leaped into the yawning gulf with a dreadful sound. The horrid beasts, dragged down by the current of the fearful cataract, bellowed as they drowned, and the winged creatures flew away with all possible speed, uttering loud cries. The shores were depopulated, and from peak to peak the electric spark annihilated distance as it flashed through the air. Soon the dull grumbling of a strange thunder mingled with the noise of the tempest, and the whole surface was rent by the same revolution.

Alas! the comet had scarcely overcome her first contempt for the Earth, and did not yet think of taking it as something serious. Accustomed through millions of ages to see moving before her eyes worlds already well advanced in civilization, like Neptune and Uranus — others which had reached the pinnacle of progress and moved along in achieved superiority, like Saturn — others on the open road to perfection and luxury, like Jupiter; others in the spring-time of human life, like

Mars ; familiarity with such spectacles did not favorably predispose her to a just estimate of the terrestrial globe. So she relapsed into her former indifference.

While she mused, the geologic revolution progressed. The jurassic formation shook the foundations of the globe, and the whole Earth trembled as if in a vertigo. The seas were swallowed up in their burning depths or poured themselves into hollowed places ; others leaped from unknown springs suddenly opened in the solid ground. The plains felt themselves swelling, as air-bubbles inflate the pellicle of melting metal ; they gave place to a system of mountains. On the other hand, mountains and hills fell in, leaving a bare plain where a thousand convulsions had before broken up the surface. Before she lost sight of the Earth, the long-haired star could see that the cataclysm whose prelude had for a moment interrupted her revery, continued in full effervescence, and that the reconstruction of the globe had begun.

The comet, going with a speed of about 70,000 leagues per hour, or a million and a half leagues per day, from her point of departure, and diminishing this speed as she went, three months after leaving the Earth's orbit, reached a point in space where the most remarkable sight awaited her. There were at this time between the orbit of Mars and that of Jupiter, several planets sprung from a primitive ring which had escaped from the solar equator, between the birth of Jupiter and that of Mars. Instead of forming a single globe, as had happened with other planets, this heterogeneous

ring had formed a good many as heterogeneous and fragile as itself. These globes revolved around the sun like others, having years, seasons and days. Now, as the comet approached the largest of their orbits, meditating on the revolutions of which the Earth had just furnished her a specimen, and pondering on the destinies of the Universe, this immense globe coming towards her at the rate of 16,000 leagues an hour, and moving in a right line in a way to meet at that point in the orbit which she was about to cross, and to occasion an inevitable collision, — this huge globe, I say, burst like a bomb, a few minutes before the encounter. The vapors ascended and consolidated on the tail of the comet, and a dozen fragments were detached and kept on their journey into space. It was the end of a world, — a premature end, no doubt, resulting from an internal cataclysm that had been long preparing. This event happened at the distance of 106,280,000 leagues from the sun. Perhaps from it resulted the little telescopic planets, Bellona, Galatia, Terpsichore and Lato, the distance of all of which from the sun is 2.78, the Earth's distance serving as a unit. It seems as if these little stars went, every year, to look at the melancholy spot where occurred the terrible catastrophe that separated them.

This was the road of Damas in which the mind of the comet was going to be permanently impressed; from it were to date the kindly feelings with which she was henceforth to be animated. Perhaps, but for this event, she would have remained a long time in her indif-

ference ; but as has often been remarked, an unexpected cause sometimes suddenly transforms the most obstinate natures. With a sentiment of good-will, that the truly great usually feel toward the very little, the comet, at sight of this tragic catastrophe, felt her memory painfully aroused ; she feared for a moment for the life of the Earth. “ Poor Earth ! if the dreadful revolution which began just now should be fatal and carry her off before she was born ! What will become of her amid the calamities which she was just now suffering ? Will she be strong enough to overcome and survive them, or is she destined to be the savage home of monstrous and cruel creatures ? ”

From this day she became more attentive, and the lot of the Earth became more touching to her as it was more humble. Often she surprised herself thinking of this poor creature ; often she passed designedly close to the most magnificent spheres, without casting a glance at them. No doubt she found her route sometimes very long ; to be absent from the Earth 3,633 years, and to be near it only eighteen months, she thought was a rather ill-proportioned arrangement. Finally the little world took a place in her thoughts, and seemed to fix itself there more and more firmly.

She waited impatiently for Summer. The summer solstice is the time when comets move toward their perihelion and approach the Earth. When she felt the sun’s heat become more intense, and saw that luminary grow in size, she knew she was at the end of Spring. As soon as the Earth became visible, either in the form

of a little round spot on the sun, or as a half-moon at the right or left of the radiant star, she was happily conscious of increased speed and of the approaching goal. So she came at a great pace near the terrestrial globe, that she was to hold dearer and dearer, and on the first day began an inspection of her little world.

She witnessed the awaking of animals of the secondary epoch, from the lias and oölitic periods, even to the last of the cretaceous sub-periods. For three thousand times three thousand years, she followed the slow and regular succession of animal and vegetable species. Becoming gradually accustomed to the revolutions incident to the establishment of all things; having witnessed the cataclysms which transformed certain parts of the Earth's surface from top to bottom, the internal convulsions from which volcanic craters yawned to vomit forth their horrible fires, the upheaval of the mountain ranges which made ready on the surface the reliefs by which the geographic configuration would be shaped in the future, she had come to dread less seriously the effects of these great movements, to believe that some unknown law controlled them, and to feel that they must result to the advantage of the suffering globe. Thus in each of the years — three thousand times as long as ours — she watched the growth of the little terrestrial child in its cradle.

But truth compels me to add, that she did not persevere without faltering in her anxious care. The cause of her defections it is good sometimes to ponder on: that familiar association with the great may

weaken our fraternal sentiments toward the humble. Passing the best, or rather, the longest part of her life among the patricians of the solar empire, the comet had unconsciously been under contagion, and had grown to be rather proud by contact. Her interest was maintained without change about forty thousand years ; but from that date, she seemed a little bored, and, without knowing it, awaited the summer season with less eagerness. She had become used to the sight of Earth, and divided her thoughts between it and the other planets. When she drew near them she looked at them, and again, as formerly, comparisons rather unfavorable to the Earth occurred to her. For twenty thousand years she was in this state of mind, and it was to be feared that the superior spheres would regain their ancient supremacy in her esteem. But the Earth progressed more rapidly than they, being younger, and the scene changing to the time of the tertiary formation, the comet again bestowed upon it all the favorable interest that had been distributed among the other worlds.

III.

D A W N .

Small as it was, and humble as was its rank in creation, the terrestrial globe deserved the notice which the famous traveller took of it. It is not exactly size or weight that makes the value of a creature, for the

creature, daughter of an infinite power, bears printed on its forehead the signet of its author. A little object in nature is as admirable as a large one. This is a peculiarity inherent in infinite power; it may be, like the sun, reflected as perfectly in a drop of water as in a vast ocean. The intelligent cosmopolite did not fail to make reflections suggested by the study of Nature, and in her solitary reveries raised the terrestrial world to the rank assigned to it by right of birth — its patent of nobility — being crowned with a divine diadem.

The Earth, moreover, disclosed gradually the greatness of its origin. It slowly emerged from its primitive swaddling-bands, and stripped the shapeless star to make it beautiful. Elegance began. Hitherto plants and animals were rude and coarse, dull, and unattractive; the rough trees had no flowers or fruits; the animals were destitute of fur, fleece, plumage, or dress of any kind. But at the time just reached, flowers and fruits were seen in the first kingdom, and luxurious coverings in the second. In the *Banksia* the proteacean family displayed fine fruit-bearing branches.

Mimosas now yielded acacias and *jugas*, to-day believed to grow exclusively in savage Australia. Birches, horn-beams, walnuts, alders, grew among palms, pines, yews and cypresses, not separated as in the present day, by the laws of geographical distribution. In the marshes, rivers and ponds, were horse-tails and water caltrops; and the gigantic flowers of the lily family spread beautiful *nenuphars* on the bosom of the tranquil waters.

To what eyes did these beauties disclose themselves on the Earth in its dawn? To what ears breathed the harmonies of Nature in the sounding seas or the whispering leaves? For whom did the deep forests rise from silent fastnesses, open their ravishing perspectives, and spread their carpets, watered by the broken light? On what brows fell the silence of starry nights, and the serene gaze of the silver moon? For whom were these ancient splendors? For whom these celestial beams, this verdure of the fields, these perfumed airs, this murmur of natural hedges of trembling leaves, these grand sights of earth and sea? For whom were the sun by day and the stars by night, the azure heavens, the many-colored clouds, these gilded glimmerings of twilight, these rainbows and meteors? For whom was the toil of this vast Nature? No spark of intelligence yet gleamed on the Earth.

In lands where civilization shines to-day, in the country where our own brilliant capital has risen, the waters of the ocean still prevailed. The region where France was to be, showed no indication of its present form. It was a medley of great lakes and peninsulas. The sea descended below Paris, even to Bourges; from Valenciennes to St. Lo. On a level with the water, was the irregular ridge of the cretaceous formation. The table-land of Langres was formed after the jurassic period, and dominated that last sea; the high summits that Langres was going to crown with his dark battlements, those where Cæsar was going to light the fires from which Montigny-Le-Roi was

going to win the sparkle in its name, the hanging caves, whither Sabinus would one day flee from the wrath of the Roman eagle, — these venerable peaks still watched over the antediluvian waters. Ancient Auvergne, like Brittany at its left, and the Alps at its right, had stood erect since the distant ages of the primitive epoch ; but Lyons, Tours, Paris, Dunkirk, were still beneath the sea. In the tertiary epoch these spots came to the surface, to remain, if not for a definitive period, at least for a considerable time.

The predecessors of the animal species that still live in our day, were ranged according to the date of their apparition. After the life of the seas came the amphibia ; after the amphibia, creatures born on the solid ground ; so true it is that there was nothing fortuitous in the creation, and that the succession of species was controlled by eternal laws. The first of mammiferous quadrupeds were pachyderms, — the *Paleotherium*, *Anoplotherium*, *Xiphodon*, intermediate in organization between the rhinoceros, the horse and the tapir. The first, as large as a horse, had a head like a tapir's, crowned with a fleshy horn, little dull eyes, and massive legs. The second, on the contrary, had great legs and a tail a metre long, which served him as a rudder in crossing lakes or rivers. The third was a graceful chamois, timid and swift. There was also the *Lophiodon*, whose form varied, according to species, from that of a rabbit to that of an elephant, and the *Chiroptamos* that inhabited the rivers. In the seas, where the *mososaurus*, whose jaw, a metre long, was

the latest stamp of the cretaceous period, still occasionally lifted their huge heads above the water, the Dauphins, gentlest kind of whales, were kings. Relatively to us, the population of the Earth preserved the strangeness which astonished us in earlier epochs.

When the comet arrived near the Earth, at the dawn of the last epoch, the eocene (*ἑως*, dawn; *καινος*, recent), she could see regions where life was rapidly developing. The law of destinies was revealed in the sight; she concluded that an unknown Will presided over the growth of this little globe, and was working a home for some new creature worthy of receiving the sceptre of a world.

The purified atmosphere permitted the sun to pour a liberal flood from the urn of his life-giving rays; the quiet waters reflected a clear sky; a thousand plants poised in the air their verdant plumes, and the first flowers admired themselves on the brink of the waves. Herds gambolled on the fields, and happy birds soared toward the upper heavens. Life radiated upon the dawn. The seasons began to be defined. The comet saw that the government of the Earth already resembled that of the greater worlds. Accustomed, like all comets, to pass from the extremes of heat and cold, to draw near the sun in each of her burning summers, and retire to enormous distances in her winters a thousand times colder than those of the Earth, she was always happy, in her natural goodness of heart, to see other

worlds free from these rigors.* The Earth was one of these fortunate planets. This fact connected it more closely with the other worlds, and occasioned a certain feeling of pleasure, in its behalf, in the mind of the comet. The rank of the Earth began to be fixed.

This slow but steady growth gave to the journeying star maternal joys, to which she had hitherto been a stranger. When, for the first time—in a journey in which, owing to a certain disposition of all the principal planets behind the sun, she went nearer to it than ever before, she noticed the existence of two other planets between the Earth and the sun—Venus and Mercury, she would not permit her attention to be drawn to their quarter, and refusing the pleasure of

* Yet she must have wondered at such uniformity. The ellipse of certain comets is so long, that at the time of their aphelion they must endure an intensity of cold of which we can form no idea, while at their perihelion they must pass so near the sun as to receive heat of equally inconceivable intensity. Newton calculated that the comet of 1680 received, in passing near the sun, twenty-eight thousand times more sun than we have in the summer solstice, and that its temperature must have been raised two thousand times higher than that of red-hot iron. He added that the destiny of comets was to fall into the sun, to feed his fires. Did the author of "Letters from the Tomb" allude to this dreadful fate when he wrote: "A mighty comet, already bigger than Jupiter, still farther aggrandized herself by absorbing six other feeble comets on her way. Diverted from her usual course by these little shocks, she did not exactly adhere to her orbit, and, poor thing! plunged into the consuming furnace of the sun. It is said that this comet, burning alive, uttered terrible cries."

witnessing the early stages of their development, wanted to forget them as if they were still in chaos, and to give her thoughts to no subject save the Earth. Once, passing near Mars, she saw on that globe a creation very like that of the Earth, and which made the same claims upon a tourist's curiosity. As she had treated Venus and Mercury, she left Mars to slide in his ideal orbit, heeding only the terrestrial globe when she passed in its neighborhood. It is plain from this simple fact, that she had recovered from her former indifference toward us, and was warmly interested in all that concerned our globe.

In her hundredth journey, reckoning from the first which we reported at the beginning of this narrative, that is, about the 304,689th year, the brilliant comet had witnessed the prelude to the great geologic epoch that preceded that in which we are living. Fifty thousand years later, she saw the disappearance of this eocene phase. Two thousand years before our era, she reached the middle of the phase that we call miocene.

Dawn, morning of life, luminous beginning! Hereafter the forms of existence will no doubt be clothed with a more exquisite elegance, a more perfect beauty; but now one feels the sap of universal spring mounting from all roots and rising to all cymes. Hereafter unceasing progress will continue its work; but now all the forces of nature are in full virility, and make ready to the hope a spectacle that no other epoch can promise it in the future.

On the vast dial of the heavens, if our centuries are

seconds, and if the Earth's day in astronomical reckoning is counted by millions of ages, would it be strange if the dawn of such a day should be counted by the same measure, and stretched over a long series of centuries? The ephemeral periods, by which we reckon the phases of our real life, are insignificant measures in the life of Nature; a century leaves no trace on the brow of that ever youthful being; ten centuries, a hundred centuries, make not a wrinkle.

For measuring the first years of a globe a thousand and a thousand centuries old, the comet was more advantageously situated than we are on the Earth, as is the case with all comets. A year to her being, in fact, more than three thousand years, there was always at least this interval between her visits, which supplied her with a natural chronological scale, unvenerable, and well capable of measuring terrestrial evolutions.

Despite this long interval, so great to our eyes, but so small in the indeterminable duration of heavenly creations, it sometimes happened that she saw not the slightest change in the appearance of the Earth between two of her successive visits, so very gradual were these changes; often she observed the same scenes, the same landscapes, the same vegetable and animal species as if the creatures that she had seen three thousand years before, had remained in full life and of the same age. If this happened, notwithstanding the length of her year, what would have been the case if her time of revolution had been shorter? It

would have been plainly impossible for her to study this slowly progressive creation.

To these advantages peculiar to the cometary nature were joined others not less important; there was the constant comparison that she was able to make between other worlds and ours. Formed in the heliacal regions of the system, where the most distant planets were flourishing in the midst of prosperous careers, she had witnessed the birth of none of them, all being her elders. She had always seen them in the full vigor of life.

Neptune, the farthest and oldest star of all, had already passed its noon. In the far regions where it dwelt, the Earth would have been speedily frozen and sterilized; but owing to diversity of action of the forces of Nature (worlds being always born in harmony with the place to which they are destined), Neptune lived in the desolation of his peculiar life, his years each as long as a century and a half of terrestrial time.

Uranus, not so old, was in the middle of his life; his was another life, of other forms and aspects; a life incompatible with the preceding, and essentially different from those mentioned below. In its rashest adventures, the human imagination is powerless, unable to lift itself to the possibility of existences different from our own, incapable especially of figuring unknown forms. Around the world of Uranus revolve four retrograde moons, which, like their sovereign, already reckon in the past of their chronology the vanished

phases of their first youth. Each Uranian year is equal to eighty-four of our years.

Saturn, we have seen, was at the height of his splendor, and advanced from perfections to perfections. To say that the Saturnians were rapidly moving toward the apogee which the Uranians had already attained, would be inaccurate, for the perfection of one world is not the perfection of another, and at no epoch in their long history could the worlds be arranged in a single series, each receiving an order-number on the same scale. Each has its own destiny as well as its own means for fulfilling it. The Saturnians have years thirty times as long as ours, and eight satellites, which give to their calendar eight lunar months.

Jupiter was then in the hey-day of his youth, brilliant with vigor and life. He had evidently long ago left behind the phase corresponding to that which the Earth was just passing through, and the pulses of his vital force throbbed with a moderated fervor. His year was twelve times as long as ours; he kept his primitive spring perennial, while the seasons began to be perceptible on the surface of the globe; four swift moons revolved around him, lusty, like himself, with exceptional life.

The comet had observed all these things before the day of the Earth's first appearance to her, and this fact was, no doubt, one of the causes of her contempt. The most striking consideration — which had given the most damaging blow to the reputation of the Earth, in her opinion — was the insignificant size of that globe

compared with Jupiter ; the Earth seemed to her like a stray moon, and she was not inclined to condescend so far as to take notice of it. There was, indeed, a very material difference between the respective dimensions of Jupiter and the Earth.

The diameter of Jupiter is eleven times greater than that of the Earth ; hence its surface is one hundred and twenty-six times, and its volume one thousand four hundred and forty times greater. Mars, at that time, was in a condition like that of the Earth ; though older, it had not grown very rapidly, and its growth had been arrested in its early stages ; and then, as the star with the flowing locks had made the Earth the object of her first scrutiny, by virtue of a general condition that we may call moral inertia, she remained wedded to the study of this globe, and it would have been difficult to divert her attention to another that offered no new titles to her interest. The Earth continued to be the humble centre of her thoughts.

The moon was then inhabited by the little nation of Selenites. But of course this world was too insignificant to fix for any considerable time the notice of the magnificent traveller.

Notwithstanding her bias in our favor, an event, to be expected from day to day in the life of beings, nearly put a stop to the persistent and fruitful observations of the comet. There are among the dwellers in space certain acts that correspond to those of our life. We will dwell an instant on this, because a certain

importance is attached to it; it concerned the marriage of our comet.

During twenty-seven thousand years a magnificent aërolite of fine appearance and the first water, had remarked the wandering comet passing afar through the wastes of space: solitude unites thoughts, and perhaps one might think that, solitary like herself, he felt drawn toward the star with the streaming locks of gold. For twenty-seven thousand years this bolid, one of the giants of his kind, approached with his own the cometary orbit, in obedience to universal gravitation. (These huge metallic stones revolve around the sun, like the comets.) At the end of so long a stage the meteor, approaching her, ran five thousand leagues in less than a minute, traversed the zones denser and still denser, that adjoined the centre of gravity, and formed thenceforth the nucleus of the comet. Was this the origin of many other comets? History does not tell us; and, moreover, philosophers who have proceeded here by a hardly legitimate analogy, have fallen into an absurd exaggeration. But whatever the origin of these comets, it is certain that there are more of them in heaven than of fishes in the sea, on the authority of Kepler: what would be the consequence if their number increased without control or limitation? One needs a certain resoluteness of mind to face coolly the host of these stars that cross each other in their rapid flight, and one may well ask himself how it happens that, their innumerable orbits cutting that of the

earth in every direction, there are not more frequent collisions between the planets and the comets !

We will not dwell on this point. The comet is still to us what she was, the sole actor in the drama. The bolid has been absorbed in her, and no longer has an individual existence.

A vulgar writer would say that it was about this time when the first duck came to paddle in the muddy waters of the country that was going to be France. The comet, more refined, and classically educated, hailed the apparition of the web-feet in a stream on which Lutetia (*lutum*, muddy) was to moor her vessel. The frogs croaked, the efts slid, the adders curled, for the first time. The storks and flamingos stood haughtily on one foot. The crows streaked the heavens in their flight, calling harshly ; the blackbirds whistled ; the sparrows seemed to be waiting for scattered crumbs ; and the gayest birds dwelt in the verge of the deep forests, and built their first nests on every branch. The marmots, the squirrels, the genets, the beavers, the hares, the dogs, the cats, the coatis, inaugurated the series of the humble kingdom that was to come to life after the creation of man, and the first apes climbed in the pliant branches of the convolvulus : there were the pittacus, the dryopittacus, and the mesopittacus, whose horrid grimaces foreboded the champions of all causes in the humanity of the future.

IV.

THE PARISIANS BEFORE PARIS.

Comets, by reason of their long and patient observation, have the admirable habit of trusting only the testimony of their own eyes, enlightened and discussed by their impartial reason. They have no prejudices ; and never will they be accused of not saying what they think or saying what they do not think, merely for the sake of pleasing a patron. Independent travellers, they pass their lives in comparative observation, and are, perhaps, the wisest daughters of the heavens. Therefore, to give an example of the wisdom which characterizes their conduct, we will say that notwithstanding the friendly regard that she bore toward the Earth, notwithstanding her state of mind and the pleasure she would have felt in hailing the first *intelligent creature* she should see on the surface of this world so richly prepared, our comet, looking for this creature at the end of the tertiary period (that is, forty of her years, or about the year 104,490), looking, I say, for a superior inhabitant more or less resembling those who ruled in other worlds, but finding no indications of his presence, with good faith and rare justice, came to the conclusion that such a being certainly did not exist, and that the Earth, beautifully and elegantly arrayed, as it then was, shone for only a blind void.

The Isle of France emerged from the waters. Like

lofty genuises who often foresee the destiny of the humblest states, the comet felt specially drawn toward that region. Twice had the sea spread over that noble soil ; but the geographical configuration that it was going to preserve had been defined only as to the shores. A very complex population occupied it. Where Paris was going to be, the comet saw the very primitive predecessors of the Parisians. Hippopotami bellowed in the mud of the swamps, megatheria, (*μεγα*, great ; *θηριον*, beast) camels, and other ruminant animals, began their wanderings ; huge stags and swift dogs chased and fled from each other in the thick woods. On the banks of the Seine, in the promenades where, at a later day, exquisites were to display their airs and graces, were seen peacocks, the first types of vanity, — and not far off, huge storks walking with haughty step.

The population was, as in our time, very mixed. Turtles neighbored hares ; dogs looked at cats with an air of contempt, and the goslings came behind the geese ; the jays, however, did not yet know how to strut in borrowed plumage. But horses galloped free over the open plains, their white manes floating in the air ; oxen lived harmoniously in herds ; heifers descended to the stream to drink, and together went from pasture to pasture ; sedate elephants, deans of the time, paid lordly visits to the landscapes of their peaceful domain. Giving the last pencil-touch to this panorama — which calls for the presence of man — the snows of the distant mountains on the horizon rose

into the clouds ; on the plains near at hand black fir-trees dominated the forest, elms and oaks clothed its skirts with their bushy cymes, lindens adorned the edges, lofty poplars towered in the open field, and willows bent over the murmuring streams.

The diversity between different worlds is very great, and the productions of nature in one soil are very unlike those in another. The constituent matter of creatures is something passive, of unqualified obedience, and is moulded marvellously at the caprice of the force that rules it ; that force alone is sovereign. This explains why natural forces existing in different degrees of intensity or association in different globes, have produced on those globes creatures essentially different from one another. In spite of this necessary and endless variation, the comet had no difficulty in seeing that the Earth was approaching the point which its companions in space had already reached, when the lord comes to take possession of his domain. It was not like other planets, but in the preservation of its individuality, its state of preparation was clearly visible. So in a series of several apartments, furnished according to different tastes, modes and styles quite distinct, and even opposite, the eye easily determines if they are ready for speedy occupancy.

Yet, will it be believed? the comet had to wait almost thirty of her years before even beginning to enjoy the realization of her hopes. Often she made deceptive discoveries ; often she thought she saw traces of human handiwork ; often, at the distance which she

always maintained from the Earth, she saw groups of new creatures, — chimpanzees, gorillas, ape-baboons, or ourangs, which seemed to announce the longed-for creation; but the illusion was soon evident. At certain times during the years 44164, 41099, 38034, and 34969, she was full of hope. As in April, the fine bright days of summer make a first appearance, light, heat, and sweet odors falling upon the lukewarm atmosphere; so in this April of the Earth, there was such an anticipatory time. One species appearing clothed with what seemed to be the sovereign character, flourished on the smiling plains of a great continent, since vanished; already herds were grouped about it in a kind of voluntary family union; already the elements seemed propitious to the accession of a great king; but it was a premature growth, and the comets soon saw that it was not man.

Perhaps the name of Troglodytes might be given to the primitive creatures I refer to, since they lived in natural caverns, either in the sides of the mountains or in the depths of the forests, and never placed one stone upon another to make the rudest structure. Perhaps they were the stock of the human race, and the common feature which connects it with the anterior animal races, for Nature *non facit saltum*. But the watchful traveller could not solve this grand mystery. During the four years that we have specified, she looked at them without coming to a conclusion as to their real character, and when in the year 31904 before our Era, she returned to her perihelion, they had disappeared,

and in vain she sought for their vestiges or their successors on the Earth.

Sometimes, too, huge apes were seen walking, cane in hand, in the glades of the virgin forests, and sometimes two companies, armed with great clubs, met on the edge of a wood and had a battle; the dead and the wounded lay where they fell, and were unfeelingly forgotten. Elsewhere other apes played together in an innocent and friendly way, yet treacherous sometimes, — a peculiarity which proves a certain intelligence. Sometimes several of them undertook to plague a sleeping crocodile, who, waking with a start, saw them scatter as fast as they could go, and amused himself by extending a claw and cracking the head of the smallest or slowest. Again, parties were seen feasting joyously, celebrating, no doubt, the nuptials of some important member of their society. These, in truth, were the only creatures that yet interested the comet. She watched them for fifty years without growing tired. The others seemed to possess not a quarter of their intelligence. Horses, elephants, dogs, and cats, seemed to be more docile, and perhaps some day their education by man will raise the level of their faculties, and render them more intelligent than the apes; but at this time, the latter were indisputably at the head of creation.

Afterwards she saw in the torrid equatorial regions, other creatures very much like the preceding. Like them, they were black, lived in little families in hollows, or in the woods, killed each other occasionally,

hunted the birds of the air, and hid themselves at night. In two points only was there a slight difference between them and the others; the first amused themselves a good deal, while the others seemed to be always in a fierce humor; the first sometimes lighted fagots in a small volcano, while the others never tried to do this. These two points excepted, the two species were as nearly alike as two drops of water.

By one of those happy coincidences rarely witnessed, save in romance, our comet, who, as we have said, withdrew to a distance of fifteen milliards, 387,800,400 leagues from the sun, met the same year when she made the foregoing observations, a great parabolic comet,* which came from the sun α of Centaurus, our neighbor at a distance, as is well known of eight trillions, 603 milliards and 200,000,000 leagues. The two availed themselves of so rare an opportunity to join company, and the comet of Centaurus accompanied our own as far as the orbit of Neptune. They conversed only for a cometary minute, — that is, only 390 years; but this brief time sufficed to put our comet into very good spirits, because her gossip — a very intelligent person — had assured her that if she had seen fire made on

* Those comets are called parabolic, which, instead of following a rigid curve around the sun, and repassing periodically the same points, deviate from the ellipse and do not return to it. They then go to indeterminable distances, escape from the limits of solar attraction, and sometimes intrude within the domain of another to which they are attached for a certain time; then they fall into still another system, and continue irregularly their vagabond career.

the Earth, she could safely conclude that there **was an** intelligent race thereon.

They talked about the extra-Neptunian realms, the parabolic comet displaying great learning and profound experience, for there is nothing like extensive travelling to teach us to estimate the comparative merits of different countries. But on the other hand, it sometimes impairs the solidity of our judgments as to certain absolute truths, quite independent of nationalities, and this chance-met comet was quite at sea when grave truths were in question. For this reason our comet resolved to guard herself against the fascinations of the stranger, and never to become parabolic. I will not report their conversations on extra-Neptunian things, since they are beyond our comprehension. Our farthest glances—I mean our telescopic sight—do not pass beyond the Trident, whose sceptre is restricted to an empire two milliards 300,000,000 leagues in length.

On her next return, our bold traveller had the fondest hopes of the Earth, as she drew near. This precious globe exhibited itself to the rising sun in the most coquettish and brilliant aspect she had ever seen. It shone with youth and brightness in the limpid heavens. The plains were verdant as on a dewy morning; flowers disclosed themselves, and the thickets displayed blown roses by the side of lilies. Surely the last epoch, the quaternary, had begun.

If many volcanoes still smoked in the mountain ranges, and reddish vapors rose in whirlwinds to the sky; if the Earth still shook, and seemed to stretch its numb

limbs ; if the heavy pachyderms crushed the enamelled velvet of the prairies, while lions and tigers roared in the vast deserts ; if huge winged hunters swooped on little timid creatures to devour them, while the bitter waters harbored ruthless monsters,—all this was because the Earth was not yet become a perfect world, because it must remain an inferior world, where, alas ! the law of death will rule, as a supreme condition of the law of life. But it was plain that the rude primitive types were disappearing and giving place to a more advanced settlement, established no doubt upon a permanent basis. It was evident that from the mountains to the plains, and from the forests to the sea, the era of occupancy by a sovereign able rightly to estimate the worth of such a dwelling-place, was no longer in the future, but in the present.

Supremely eager to see at last on the Earth, creatures capable of comprehending the beauty of these sublime scenes, creatures noble and powerful, with foreheads illumined by the sacred aureole of thought, the attentive comet watched. She had indeed seen, six cometary years before, bipeds with yellow hair pass from one cave to another and follow the chase zealously ; she had indeed noticed, the next year, creatures armed with bows, darts, and hatchets, and knives of flint, assembled sometimes in mud villages,—even on the lakes, like beavers ; but she could not make up her mind that the human race had such representatives. In each of her periheliacal passages she eagerly took a view of the whole globe, embracing all of its countries

in her gaze, and her heart beat every minute at some deceptive discovery. For fifty thousand years, and especially during the last ten thousand, she expected to see man appear; indeed, she deserved to win this reward at last.

In the fertile valleys, washed by the upper affluents of the Ganges and the Indus, above the gigantic Himalaya range, perpetual Spring spread its bounty. The Iranian zodiac originated in a point in the heavens that marked the solstice in the year, — 19337. Two great races lived subsequently under the institution of this first astronomical calendar. At the time when the comet passed, these two races were reunited; they were the Aryans, a nomadic tribe, who, she instantly saw, were superior to the creatures before described; not only were their forms more perfect, but they showed unquestionable signs of intelligent knowledge. Families were gathered in tribes, and this primitive national life, carrying tents from region to region, bent its course toward the sun. The East was waking up; and perhaps the cradle of intelligence was there. Had God just stretched out His hand upon His latest creation to fix upon its brow the ineffaceable sign of consciousness? Or, rather, had He not yet touched the feeble forehead of the creature still too young? The use of reason is not given to the child the day after his birth.

When an acorn is cast into the fertile ground, the years descend and press the hidden germ. Many snows whiten the soil of the forest, many springs shed

their dews upon it, and many Julys dart their healthful heat beneath its tufted cymes. A long, long time afterwards, a young green oak steadies itself against the buffeting winds, and little birds alighting on it bend its tender stem. But if ages pass over the growing cyme, with these centuries will be born the true greatness of the wide-branched tree. Generations will come to sit in its shade, and figures will fail to count the number of its years. So in nature everything grows slowly; so in the divine work all things progress according to the majestic sequence of the ages.

V.

THE EAST.

The star who had watched with maternal solicitude the gradual development of the terrestrial creation, observed that in these later days there was more rapid progress from period to period. Yet three thousand years are so short a time that the advances made therein were very small. Only by the great number of her termillionary journeys had the star investigator been able to gauge the growth of the creation, and its advances toward a perfection perhaps unlimited.

Stronger than ever in her hopes, our philosopher bestowed great care on an examination of the patriarchal tribes of the Indus. But how far below the

inhabitants of other worlds — whom she had known in ancient times — were they! What a gulf separated them from the truly human era, in which science, literature and art are cherished by the nations! Though the mind has awoke under this still flattened cranium, though it already has self-consciousness, it has not emerged from the night-time and the sway of dreams. It lives in perpetual fear; it invokes the elements, inanimate things, natural phenomena, calling these superior powers; but, too, it already thinks, and already, through poetry, it communes with the universal source of all things.

Not until the 13,514th year before our era, did the comet think she could detect, for the first time, the appearance of a human state; it was only a rude gathering of stone huts. Yet no one could paint the enthusiasm with which she hailed it, or the delight with which she verified this palpable proof of the progress of the intellectual family on Earth. On the vast liquid plain that surrounded the greater part of the globe with an emerald sheet, an irregular triangle of yellow ochre was cut out. This region seemed to be less fertile than that which was seen at the right, and in which the Hindoo tribes had been lately seen; but at the far North there was a country of extraordinary richness. It seemed that man, having been able to compass the whole of the terrestrial sphere, and to compare its several parts, had chosen the most beautiful and pleasant, — a fact which tends to show what a supreme intelligence rules over all things. Through

this favored region a great river ran, dividing itself into two branches just before it reached the ocean. In the upper part of the triangle formed by this division, appeared the primitive city, — Memphis. It was destined to yield its kingly supremacy to This, and still later Thebes was going to eclipse its two predecessors.

The celestial observer had not yet, it is true, caught a glimpse of the white race among men ; but she saw that great improvement had been made in the looks of things. She saw that men were united in special associations for special purposes, and that already a kind of union joined families into one people. In the evening, when fires gleamed on the horizon, she saw men led by others going to kneel on the banks of the Nile, and gaze at her own reflection in the quiet waters. During the night, from the summits of mountain-like pyramids, other men, clad in different costumes, observed her position among the stars. These were the beginnings of investigation ; but they were also the beginnings of the enthrallment of ignorant and timid peoples, by bold and despotic men.

As the comet visited the Earth only at long intervals, it is evident that she could form only a very vague idea of what man in his pride has entitled the History of the World. It was from a general point of view, and in their celestial aspect, that she noted the successive events of creation, and not through the illusive prism which men employ for magnifying what concerns them and depreciating what does not. The comet could not pretend to know the small details of the

• history : naturally she could not ; but she was able (as she had done in many cases, too) to interpret between the terrestrial star and the other stars of the heavens, and to tell its history with a breadth and accuracy of view infinitely superior to the illusions of men. One ought not to be astonished, therefore, if the comet did not, any more sedulously than before, seek for the petty particulars of terrestrial life ; her mode of observation had not changed, and it is not on account of the appearance of the human family that she diminishes the intervals between her visits.

Thus she could not say if, in her journey of the year 10447, the Egyptian theocracy reckoned its years in the period *Phta*, or only in that of *Phré*, of *Chunb* and *Seb* ; but she knew astronomically that a sun, a near neighbor of ours, of which she had heard good reports from comets that came from it—the great, the beautiful Sirius—had been able to attract the gaze and thoughts, the admiration and respect of the priests of Upper and Lower Egypt. Again, she could not affirm that the Hindoo era of the Manouantarai was inaugurated at its zodiacal origin by the first Manou-Soua-Yambhouva, and that in the year 19337, the children of Osiris had accurately determined the point of the summer solstice between the Nakchatra-Aswini and the Nakchatra-Bharani ; but she knew beyond doubt that they earnestly loved the sun, the god of fire, and feared Indra, the god of thunder. She knew, by direct observation, that the luminous East cradled in its fleecy aureoles the nascent intelligence

that was, at a later day, to descend upon the West, — our home.

She knew, too, that if the Earth was destined to become the abode of intelligence, worthy to be compared with its neighbors in space, Jupiter, Saturn, and the others, it could not reach that state in two days, but that humanity needed a long period of apprenticeship to establish itself on its own account. It is a long process, the civilization of a world! Theoretically, the comet reckoned by her years — (equal to three thousand of our own) — and said to herself that in four or five years the Earth would be ready to emerge from its childhood. Four years added to the date in question give the year 1811: was the comet mistaken? Practically she thought that a much longer time would be needed, since, according to her observations, men seemed to be eager not to help, but to destroy each other. To speak plainly, this sight most painfully affected her, and never left her memory; she always retained the first impression that she received in looking from the height of the heavens upon the great and bloody battle in progress since the earliest ages, — an impression that, far from being effaced by time, was ever freshened because the intelligent star had not even once passed near the earth since men appeared on it without seeing these creatures killing one another. It seemed to her that they were born merely to try their strength, and to exert it against one another as soon as it was great enough, and that instead of being a firmly united family, such as inhab-

ited other globes, the people of the earth constituted a kingdom eternally divided against itself. For this reason she thought it would be necessary to quadruple the number of years needed for man's enfranchisement.

An unexpected event, noted here parenthetically, made a gap in the series of cometary observations at the time to which we have come. In her journey of the year 7384, the comet's attention was fully engrossed by the moon, and in the nine months during which she remained in sight of the Earth, she had no time to continue her studies. About 59489 — that is, about seventeen years previously — she had remarked on the star that is our neighbor, and constantly attends us, like a faithful satellite, a general movement that had wrought a strange division on the lunar surface. Two essentially distinct natures had taken possession of each hemisphere; the inhabitants, passing from one to the other, thought they were entering a new world. Now as there was no balance of power there, the richest party gradually absorbed the poorest, as if it had sucked away all the latter's sap of life, and was determined to rule without a rival in the human kingdom. All the fluids and all the liquids made gaseous passed from the hemisphere that faced the Earth to the opposite one; and just as the comet was passing, the Selenites themselves were emigrating into the only hemisphere that remained habitable. They were seen to pack their trunks and hasten from all quarters toward the circle of the horizon, little and great, fat and

lean, rich and poor, — all started for the new world, so that the unfortunate hemisphere was left henceforward utterly deserted, and to-day even the lonely rocks stare eternally into a dreadful silence.

Another event almost put a stop to our comet's investigations. In her ante-penultimate journey, she thought she heard the last sighs of the Earth. A mighty flux burst forth, and torrents had inundated the inlands; plain and mountain seemed to be submerged, as if the sea had broken the bounds of its kingdom to impose its fatal sway upon the ancient continents. But when in the evening the globe had turned one hundred and eighty degrees, and presented its other hemisphere, the comet saw that the deluge was not universal, that it affected only the primitive regions of Asia, while the two gigantic American triangles were shining in the sunlight, opulent in splendid vegetation, in animal species at the meridian of their rule, and men immersed in life and the adoration of nature. These were the ancestors of the Toltecs, soon to be replaced, first by the Chichimecs, and later by the Aztecs, who would presently unite the Tapanecs, the Colhues, the Tlatelolues, and other tribes, and found the famous city of Tenochtitlan, on the islands of Lake Tezcuco, which islands were one day to be consolidated as a firm foundation for the capital of Mexico. Still were visible the mountains where Manco Capac was to build the republic of the Incas, worshippers of the sun, and where Pizarro would appear to establish by conquest the

vice-royalty of Peru. Between the two Americas many little disunited States were recognizable. The comet naturally reflected that if the Asiatic world should be so unfortunate as to go to sleep beneath the waters, the American world would be quite capable of taking its place. But she soon had reason to hope that the life of humanity was not at all endangered. While this new world was waking up, the old one continued to grow, — all but the small fraction accidentally drowned. Egypt formed a real city, where could be seen palaces and towers, and the beginning of a shapeless piece of sculpture; the tall Pyramids oriented the land. The great capitals of India had laid their foundations. Europe was already conscious of her own existence; opening her eyelids under bright heavens, she found it was fine weather and wanted to get up. In Australia the comet saw nothing but huge apes making faces at each other.

She saw, too, in company with these human creatures of such variety, strange animals that do not exist in our day; *elephas primigenius*, or mammoth, the colossal elephant, fifteen to eighteen feet in height, armed with long inward-curving tusks, not less than four metres in length. Its bones, afterwards discovered mingled with human relics, would be taken for the remains of giants, — twenty feet high. There was, too, the rhinoceros, *tichorhynus*, covered with thick hair that was to beget the legendary dragons of sepulchral grottos in Gaul; the bear of the caves, that promenaded at Montmartre, in company with a huge tiger;

the primitive ox, and the urus that Cæsar encountered for the last time on his return from Bibracte, the stag *megaceros*, whose horns of vast extent were, three to four metres apart, and which was the prey of the first hunters who used the cross-bow; and, finally, magnificent birds, such as are no longer seen; the *dinornis*, or the *lepiornis*, whose eggs were twenty-five centimetres long, and gigantic ostriches, which would cut a fine figure by the side of man.

Our ancestors, the Celts, of Indo-Germanic race, were acquainted with these last respectable off-shoots of antediluvian generations. These noble ancestors deserved the notice of our comet, as, a hundred thousand years before, the *megatheria* and *dinotheria* had attracted her; and it is a fact worth thinking of, that the same star on which our eyes rest to-day was long ago looked at by eyes whose light was extinguished centuries ago, and by races who have vanished forever in the gulf of ages. Thus pass away the ephemeral creatures who represent to us, seemingly, all life; while universal Nature, to whom we give no thought, endures forever in her serene grandeur.

In the year 1254, B. C., our venerable traveller made her next to the last journey in sight of the Earth. Our ancestors, as we said, still lived a natural, primitive life in the shady forests of the country that was to be France, limiting their ambition to the banks on which they were born, and peacefully enjoying the light of heaven and the good things of Earth.

Their grand-uncles, whom we saw some thousands

of years before, in the East, still led the joyful and troublous life of conquest, while they dwelt quietly in the forests of their adopted country. Soon they will descend to the South, leaving behind them the Cimmerians, the Scordisks, the Taurins, the Boiens and the Cimbri ; but they nevertheless want to enjoy the privileges of childhood. They will mount toward greatness. On the other hand, those whom we have seen have lapsed in succession into decay. The Egyptians sleep ; Memphis is dead. This dreams, Thebes watches with her hundred gates ; but soon all this will be swept away by the winds of the desert. Thus many civilizations have vanished. Babylon, founded more than fifteen centuries ago, has already fallen, and Nineveh, which came next, is in ruins. Ecbatane was going to appear, and give place to Persepolis, which, in its turn, would perish. Assyrians, Medes, Persians and Chaldeans, were merely pieces of serpent ; in the other world, America was advancing slowly. China succeeded India, and the sun, spreading his serene rays, enveloped the vast country in a quiet light. Lately a little people had gone out from Egypt ; now they were established along the sea ; but they had no kings yet. At last appeared a little island in the lower part of Europe, whose inhabitants, settled there only eight hundred years, said they antedated the moon, and claimed to have been engendered from the clay of the Earth, like the grass-hoppers that their women wore, in evidence, in their hair. A momentous event then engrossed the attention of this people. A man, named

Paris, having abducted a beautiful woman called Helen, the wedded wife of Menelaus, and carried her into a little city of Asia Minor, some degrees distant, the whole nation uprose. In the twinkling of an eye they fabricated all kinds of arms, caparisoned their horses, sharpened their swords, polished their cuirasses, wrought coats of mail, put on their quivers, forged bucklers, shod their feet and their clubs, threaded the points of their lances, and packed their luggage. Never had the comet seen such preparations. Unfortunately, or rather, fortunately, for her, she could not witness the whole war, for ten years were spent in the assault on the city; and in that time the comet had traversed something like eighty-five millions of leagues; but this did not prevent her from observing that there was a good deal of noise about a small matter, and from conjecturing that if the inhabitants of the Earth set to fighting about nothing, she should finally withdraw her notice from them altogether.

VI.

IN WHICH THE COMET JUMPS FROM THE DELUGE TO
THE YEAR 1811.

“Heavens! what a change since last year!” cried the party with the flaming locks, returning near the Earth in her last historic apparition. “Is this the world whose feeble infancy I could just now have cra-

dled in my aureole? Is this the people I saw so miserable and paltry, so fearful and so helpless? Are they all dead that I saw and heard hereabouts? Men, races, states, countries, all is changed! Where are the bards who called me to witness the Celtic constitution? Where are the dolmans and the altars? What revolutions since I was here! I see no Celts or Cymry here; nor Medes or Greeks there. What city is that? But this can't be the Earth!" The comet could not get over her amazement.

There had, indeed, been great changes since her last visit, for it was now the year of grace 1811, and the comet had come full upon Paris.*

For stars in general, and for great comets in particular, three thousand years are no great matter; in the calendar of eternity, less than a second. But for man, you know as well as I do, oh, mathematical reader, that three thousand years is a long time.

* The celestial traveller, whose history we have been telling, is indeed none other than the great comet of 1811. All remember the tremendous effect of the sudden apparition of this magnificent star on the evening of Tuesday, March 26, 1811. The fruitful heat and the prosperous vineyards of that memorable year were ascribed to its influence. All the public prints interpreted it, making it talk in all tongues and to all intents. Some petted, some feared it. Some re-read the immortal prophecy of Orval; others hailed the salutation of heaven to the birth of the King of Rome. Napoleon, leaning from a window of the Tuilleries, asked his uncle, Cardinal Fesch, what he thought of the strange star. All Paris gazed, and the summer did not pass without cravats and hats *à la* comet, and comet with every kind of sauce. It made a stir that is remembered to this day.

How many generations have passed on the scene of the world since 1254 B.C.! Greece, Latium and the Kings; the Latin Republic; Carthage; the North; the Roman Empire; the downfall of the Giant; the Barbarians; the Empire of the West; the founding of the Frankish, Germanic, and Anglo-Saxon Kingdoms; Paganism, Christianity, Islamism; Schisms; the Renaissance; the growth and decay of feudality; monarchy, republic, empire. This whole series slowly passed over our country without the comet's knowing a word of it. And how would it be if, instead of keeping within the limits of our European society, we embraced the whole globe? The whole historic period of man's life on the Earth would yet be included between these two bounds:—1254 + 1811, which represent to the Comet only a single year.

Her surprise, therefore, was natural and pardonable. In one day she had passed, without knowing it, from the Trojan to the French Empire; from Agamemnon to Napoleon. A more magnificent jump, in truth, cannot be imagined.

Towns and peoples had changed. Some had disappeared; others had been born. Evidently humanity had taken a step in the meantime; was it forward or backward? The Comet, a close observer, had some reason to think that it was backward. Not only had man changed, with all that concerns him, but Nature herself had undergone a modification that seemed due to some other cause than the hand of time. The forests had contracted, and no longer covered the immense

area that they formerly occupied. Watercourses, hollowed by the hand of man, disembogued from different directions, into natural courses. The swamps were dried up. The shores of the seas seemed to be protected. The plains were crossed by white lines; villages were ranged on the hills. Busy cities sat on the banks of the great rivers, bathing their feet in the swift waters; gardens and copses surrounded the clusters of human dwelling-places. It must be admitted: in this little region of the hemisphere man had revealed his presence.

But—(where isn't there a *but*?) the comet still heard the din of arms. "Still! alas!" she said, "I begin to think they have got into the habit. Poor men! This country is not so ugly, after all. Why do they shed blood so freely in their wasted fields? Wouldn't it be better to toil peacefully under the bright sun. But do they really know what they are doing?"

In the bosom of lonely and infinite space, distances are not; and two organs made to catch the faintest sounds could receive them across the impalpable ether. Everything is relative, the intensity of noise as well as that of light. When the comets reach the far regions of their most distant wanderings, they slacken their speed, as if in the depths of space they lent an attentive ear to the unknown. It is said that sometimes, like souls that fraternize in a common exile, they exchange impressions across immensity, and alleviate the tedium of the solitude and darkness, by conversing

on the nature of things and the destiny of the beings whom they have visited. Some years ago our comet had recognized in the trans-Uranian wastes the comet of Halley, less noble than herself, but far above the average. The two travellers at once entered upon an exchange of memories.

"I find the Earth very greatly changed since my last visit," said the larger and older of the two. "Things are done rapidly in that world. It seems that they reckon three thousand years in one of mine, and that in this little period ninety generations have time to be born and die. How different from Neptune, where in six thousand years I have not seen an iota of change!"

"Honorable dowager," answered the other, "my years are swifter than yours, since for one of my revolutions around our shining king, the inhabitants of Earth count only seventy-five years; yet, in truth, in this short space they find time to do a good deal of fighting and overturning on that little globe. I am sure my wonder at the frivolity of these people is not less than yours."

"Between ourselves, they seem to be very superficial, or rather restless. Since there were men on the Earth, her appearance has changed. Formerly, before their creation, I remember making twenty or thirty journeys without seeing any great changes on the surface of the Earth. Within only five years (the comet means 15,000 years), they have kept fighting, demolishing, hollowing,

heaping up, and transforming their country till it seems like a very phantasmagoria."

"In what terrestrial year did you make your penultimate apparition, madame?"

"It was, my dear child, if I am not mistaken, thirty terrestrial centuries ago: I am not familiar enough with their little calendar to tell you exactly. As for me, I was in my two hundred and fifty-fifth year, for I counted forty-six years since the dawn of my consciousness, when I first noticed the Earth, and I have numbered two hundred subsequently."

The little comet, who was quick at figures, easily ascertained that this penultimate apparition dated at least as far back as the middle of the thirteenth century, B.C.; more frequent visits to the Earth had familiarized her with our mode of counting in Pagan and Christian years. So she could not help smiling at the thought of her venerable comrade's surprise at the changes that had occurred on the Earth since that time. Like all of her sex, she possessed in full development a fondness for talking, and asked nothing better than the privilege of relating, at a sitting, her own observations on terrestrial humanity. The other saw this.

"Dear traveller," she said, "you must know much more than I do about the subject under discussion. You have come near the Earth oftener than I, and followed its history more closely. Was the state of things that I beheld just now (she meant in 1811), the immediate sequence of that which was revealed on

my previous visit? It seems to me there is a great gap between these dates, and it must be your task to fill it."

"I have been in the Earth's neighborhood forty times since your last visit," was the reply, "and every time, — shall I confess it? I have seen a change. The life of men is so short on that globe that few of them can boast of having seen me twice in succession, and most of them have not seen me even once. Yet," she added, regretfully, "my year is forty times shorter than yours. Of my several apparitions, I remember most clearly — because the events in which I had a share impressed me very powerfully — those dated on Earth, 12 B. C., 837, 1066, 1456, 1531, and 1759. If this interests you, I will give myself the pleasure — the greater because it is so rare — of telling you this story."

As the comet was deeply interested in human affairs, and as, moreover, in the vast solitudes of her route, she rather liked the company of the young comet, she gave close attention to the words of the narrator.

Then the latter told her how, in the middle of the Chinese Empire, in the year 12 B. C., under the glorious dynasty of the *Han*, successors of the Thsin, the *Fong-siang-chi*, having observed the comet, by order of the Emperor, had recognized in her a new omen of heavenly malediction against Thsin-chi-hoang-ti, who, not content with having reduced to ashes the observatory of the Tower of Mind, built by the Emperor Wou-wang, had also cut off the heads of four hundred

and fifty of the wisest literary men in the empire, and ordered under the penalty of death that within forty days all standard books on morals, philosophy, astronomy and history, should be burned; how the imperial astronomer (the Fong-siang-chi) had advised the prince to go, as in winter, into the hall, on the left of the black palace, to offer a sacrifice to Hiouen-ming, and symbolically to renew the age of science, letters, and art; how the Tatsoung-pe had assembled the mandarins around the imperial throne, as on the occasion of the last eclipse, not to assist the star, but to salute it, and how this official had had the "roll of the prodigy" beaten on "the drum of thunder" before the Emperor himself, and how all China was afoot for two great terrestrial months. . . . She afterwards told how, in the year of grace 837, Louis le Débonnaire, son and successor of Charlemagne, had knelt to her in a dark angle of the palace court, and demanded what news she brought him from heaven; how his ecclesiastical peers had responded instead of the dumb comet, and how the easy-going Emperor had devoted his three remaining years of life to building Gothic cathedrals, rich abbeys, vast monasteries, and royally endowing churches and convents. . . . Then she told how, in 1066, Duke William the Conqueror had let the cry go through all Normandy: "*Nova stella, novus rex*,—a new star, a new sovereign;" how he took the comet for a guide, and marched under its ægis to conquer England, which may be seen to this day in the famous tapestry of Bayeux, on which Queen Mathilde, the

Conqueror's wife, delineated the leading scenes of the conquest, and a faithful portrait of Madam Comet, shining over the heads of a multitude, with eyes and arms upraised to her. . . . Especially did she tell how, in 1456, Christians and Mussulmans, at war, saw in her the form of a flaming sword, and the portent of dire disasters. Mahomet II. having taken Constantinople by assault, promised to water his horse at the altar of St. Peter, at Rome, and, on his way, besieged Belgrade. The fears of Pope Calixtus III. were intensified by the apparition of a Turkish sabre in the heavens. She told how this Pope, in his wrath, excommunicated her, along with the Turks; and how he instituted the *Angelus*, a noon-day prayer, to be offered, with the ringing of bells, for the blessings of heaven; how, after the beginning of the wholesale butchery that lasted two days without cessation, the minor brethren, unarmed, save with a crucifix, "stood in the front ranks, invoking the Pope's exorcism against her, and wanted to divert upon their enemies the deadly influence of the celestial apparition." . . . She told, further — so diverse were her effects — that on her apparition in 1531, Louise of Savoy, mother of Francis I., having seen, three days before her death, a bright light in her chamber, had her curtains drawn, and was so struck with what she saw, that she cried: "Behold a sign that comes not to any of low degree; God sends it to us great folks. Close the window; it is a comet that forebodes my death. Let us get ready!" . . . She told, finally, how her historico-astronomical era dates

from her apparition in 1682, because it was the elements of her course observed in that year that proved her identity with the comets of 1531 and 1607, and enabled the celebrated astronomer, Halley, to enrol her for life in the book of science, and give her his name by predicting her return in 1759.

She proceeded then to give her elder sister a general and synchronic history of the succession of empires, from 1254 B. C., to A. D. 1835, the date of her last visit to Earth. The larger comet was greatly astonished at the rapidity with which men thread and unthread the web of their nationalities. What surprised her more painfully still, was the means employed by the people of Earth to effect their conquests; iron, blood, hateful refinements of cruelty, — the enormity of wickedness in such little bodies of creatures so frail; the overweening of the great, the native feebleness of everybody. The universal history seemed to her far from entertaining; and if she had not, in her pride, despised the pettiness of humanity, more than once her long hair would have stood erect at the horrible stories told by her companion.

Pursuing their way, they passed Neptune without knowing it, and Halley's comet continued her cosmopolitan biography.

"Astronomy has made such advances within twenty-five years," she said, "that after my apparition in 1682 (terrestrial style), the astronomer who gave me my name foretold my return in 1759. This was rather bold. You know that while I do not plunge so far as you do

into the wastes of space, for in fifteen years — in 1873, I must return, while you will continue your journey fifteen hundred years more — you know, I say, that I yet go twelve hundred million leagues from the Earth. To us this is no very great distance, but for the little people of the Earth it is stupendous. In this interval I am sometimes detained by certain inhabitants of space, and am forced to slacken my speed in crossing their domains. Now, these gentlemen of the Observatory have a keen sight, or to speak more exactly, they possess a marvellous intuition. Thus, when on reaching the realms of Jupiter, I was for a long time quite beyond the bounds of their vision; even when aided by the most powerful telescopes, I thought I could reasonably hope to escape their figuring. Not a bit of it. Jupiter caused me to undergo a retardation of five hundred and eighteen days, and Saturn one of one hundred. Well, all this was calculated, predicted, and announced, to a month; we can no longer conceal anything from the astronomers.

“I had the luck to be announced fifteen years in advance, by the most beautiful tail ever seen — a sextuple tail — which, I hasten to confess, didn't belong to me. You saw the other day that *intriguante* who went from comet to comet, never visiting the same place twice, and who is so eccentric that she has become parabolic, and you must have noticed that she is equipped with six tails of her own. Well, it was she who played my forerunner in 1744: she was the most beautiful comet of the eighteenth century in the pres-

ent terrestrial calendar. The first evening she appeared one would have thought her a second setting sun, so brilliant was her aureole.

"I told you just now that at each of my visits I found changes in the customs, manners, and spirit of the nations. Never was this more true than during my last journey. Having left terrestrial parts in 1759, I ought to have returned in 1835. More accurately than before, they had calculated my retardation by Jupiter, Saturn, and Uranus, and had marked the route in the heavens that I should take on my return: on August 20th, 1835, I should pass near the star ζ of the constellation of Taurus; on the 28th, between Gemini and Auriga; September 21st, into Auriga; October 3d, into Lynx; 6th, into the Great Bear; 12th, into Bouvier; 13th, into Corona; 15th, between Hercules and Serpentarius; 19th, into Ophiuchus; November 16th, near γ of that asterism; December 26th, near Antares, in Scorpio. Of course, I did not deviate from the line that had been so wisely marked out for me. Now I told you that at no period of my life, and in the neighborhood of no world, have I seen such an overturning, such a revolution of ideas, as in that last journey, — a sight that, to tell you the truth, made me feel very sad; so sad, indeed, that the inhabitants of the Earth undoubtedly noticed it.*

* We read in the *Edinburgh Review* of 1836: "Halley's comet, on the nights in which it was most clearly seen, was wan and dim; it excited speculation rather than admiration. We looked at it through a telescope, and its melancholy radiance inspired us with an indescribable feeling of sadness. The longer one studies such an object, the less can one ex-

What happened on the Earth between 1759 and 1835? What cataclysm has occurred among the heavens? The longer I search for the cause and manner of this revolution, the thicker grows the darkness. The comet of Charles V. was lost in it."

"What is that — Charles V.?"

"Oh, I beg your pardon, my venerable friend, I forgot that you were not 'posted' in terrestrial affairs. Charles V. was an Emperor who resigned the crown of Germany, in 1556, on seeing one of our flaming sisters, who chanced to pass near the Earth, without being aware of its existence. This same sister was also charged with causing the deluge, and foreboding, at a later day, the death of Cæsar. She was to return in three hundred years, — in 1856; but when she heard of the overweening folly of emperors who imagine themselves the central object of the divine intentions, she bade adieu to this vain little world, and vowed she would enter another system: in fact, she went to the polar star, and the humans will look for her in vain, for she will never come back. But — to regain the thread of our thoughts, briefly interrupted by this exemplary comet — I said just now, that I was lost in con-

plain its nature. A bluish, vague light, half-extinguished in a great closed envelope, — that was the sight to be seen. *The quality of this light is strange*; it is like neither the sun's, nor the moon's, nor the stars', nor even the reflections of the nebulae of the Milky Way. One must have seen Saturn through a powerful glass in order to form an idea of the leaden light shed by this comet." — *Herschell*.

jectures as to the causes of the changes that happened in European society during my absence."

"It is my turn to instruct you, this time, my child. If the great are often placed too high to distinguish and understand what happens far below — a fact which produces the dire ignorance of which I complained to you — they are sometimes concerned with events which they view with superior judgment. Thus the little I have caught a glimpse of will serve to fill the gap which troubles you, on your part. What I know is, that in 1811, France had no King, by the grace of God, but an Emperor. The very month of my arrival a son was born to him. I remained in view of the Earth from March, 1811, to April, 1812. It seemed to me that France was alarming her neighbors by her extraordinary aggrandizement through conquests; and I was confirmed in this opinion, by seeing the great ruler levy an army of 500,000 men, and advance with it to the steppes of Russia. I know not what became of them, for, after July 1812, I could see no great matter on the face of the globe."

Comets are good logicians. By helping each other with bits of recollections and of experience in studying peoples, they almost reconstruct our history. It was a syllogism of a new kind. In 1759, said one of them, France had a worm-eaten social constitution, on which hammers, called philosophers, were beating in eager rivalry. In 1811, said the other, there was a great emperor and a great investment. In 1835, resumed the first, there was a constitutional king and a very peace-

ful France. With the help of these three *data*, they draw on a great scale a sketch of French history. Their discourse extended also to other nations; for comets have no preference for particular ant-hills. But as neighboring histories are very like their predecessor, and therefore interest us less—we being not of the cometary race—we will not report these ethereal conversations.

Thus the famous explorers of space, accustomed to large matters, weighed our globe in their fluidic scales. But soon Halley's comet bent her course into a curve to close her orbit at the aphelion, while the majestic visitor of 1811 kept on in a direct line, for she will not pause in her evasion from the solar system till A. D. 3343, when she will return at the same rate of speed. Perhaps in the intra-stellar wastes she sees worlds that are unknown to us, old worlds whose suns have died out, and who bear silently through space their cosmologic ruins and the graves of defunct humanities.

EPILOGUE.

When the comet of 1835 returns in the year A. D. 1911, perhaps she will find us merely grown seventy-five years older,—a mere trifle. But when her venerable companion of 1811 comes this way again—about the year 4876—whom or what will she find in our place? Will the brilliant capital we live in be where

now are the capitals of the last cometary year, — Troy, Nineveh, Thebes, and a hundred whose names even have not survived their ruins? Will the wind of the desert blow on the place that was once France, and the pensive willows bend in silence over the Seine of other days? Will she see again France and Paris, England and London, Italy and Rome, this long-yearred comet who has never seen twice in succession the same state or the same nation? If we continue this little history for some fifteen thousand years — we, or some other — must we add fresh novelties that shall have effaced the last, and will the history of the Earth never be anything but the history of overthrows and temporary fabrics? Comets have not the gift of prophecy. But as the author of this story is so fortunate as to know some of them intimately, and as he was too small in 1811 to venture to approach the great, proud comet of that hot year, he quite lately took the liberty of sending a messenger to the white locks of the illustrious traveller, to ask confidentially what she hoped to see on the Earth on her next visit. The author is fortunately able to close this veracious narrative with a cautious answer. The comet said nothing positive, it is true, and that is an evidence of her great worth and excessive prudence; but she told the little comet that she might return with a smiling face to the eccentric astronomer who sent her. “For,” she added in her own voice, “you may tell him, my dear, that humanity, which already seems to him so old, is only in its early childhood; it struggles and suffers yet with its

first inward pains ; but let it be hopeful ! Within less than a hundred thousand years, I'll wager my hair, it will have not only the faculty of reason, but also gratuitous and compulsory education, intelligent universal suffrage, a well-defined republican form of government, freedom of conscience, the suppression of soldiers, drivers of cattle, and human butchery."

Such were the last thoughts and words of the wandering star, who had learned to read from on high the history of the Earth and its humanity. They show us that we are, in fact, but a mite in a vast universe, but that if we employ our intelligence, we shall acquire a value that will distinguish us from brute matter. To become *spiritual* beings : this, as the comet said, ought to be always the end of our efforts.

III. IN INFINITY.

SEVERAL years had elapsed, in which I had received no communications from Lumen, though I had often pondered on his strange revelations about light, and the sight of past and anterior existences, when, one evening, at our usual hour of converse, the time when, on the third day of the moon, the silent crescent moves melancholy in the western heavens, the sweetest and calmest of hours, I heard a rustling at my side. It seemed as if some new-comer had walked over dead leaves; but I was sitting in a chair on my balcony, and there were no dead leaves. Again, hearing the same strange noise, I walked round the balcony without seeing any one, and besides, no one could have entered without my knowledge. I passed by the cupola of a large telescope, and the idea of turning Urania's eye on the lunar regions, so remarkable at this period of lunation, when they are illuminated obliquely by the sun, suddenly entered my mind and took such a hold of me that I forgot the strange noise I had heard, and that had roused me from my reverie. I spent a full

hour in studying the moon, and especially endeavored to make a sketch of the steep banks of the sea of Serenity. When the moon had set, I turned the telescope upon Jupiter, and saw more clearly than ever before the brilliancy of the white zones that cross its disc, — zones then so bright, that one of its satellites passing over the planet seemed to be black in contrast, though it was white outside the disc.

As there were then many spots on the sun, and as, a little while before, all Europe had been admiring a magnificent Aurora Borealis, the coincidence between the number of the spots, and the frequency of the auroras, during several years, led me to think that possibly there were real auroræ boreales on Jupiter, which added to the lustre of that planet a peculiar light, different from what it received from the sun and reflected into space.

Thus I had spent the evening in astronomical observations. About ten o'clock there was a perceptible fall of temperature, a fire was lighted in a faience stove on the next floor, and I went occasionally between my observations to warm my feet. You are no doubt thinking, my dear reader, that these are unnecessary details of no value. Reassure yourself, for if I set them down here, it is because they are needful for the explanation of what follows. Well, one of my colleagues came, near midnight, to speak to me about a double star that was approaching the meridian. While we talked, I thought I would show him my sketch of the steep banks of the sea of Serenity, and ask him if he

thought it faithful. I looked for it first on my desk, and was surprised not to find it there. But it was lying under the stove. "There!" I said, "I looked for it at a distance and here it is right before us. See: Mount Roëmer is brilliantly illuminated. The great crater of Possidonius is only half in the light, and the shores of the Lake of Dreams are quite full of cracks. The circus of Le Monnier and that of Vitruvius stand out with wonderful clearness. . . . But I don't know why I keep this sheet of paper instead of showing it to you. Take it, and, at your leisure, examine this meridian of our satellite for which the sun is just rising."

My colleague took the paper, and I was about to train the telescope on the double star he had spoken of. It took me fully five minutes to place the instrument in position, and in that time he spoke not a word of either approval or censure of my sketch. When I turned to ask him to look, he began to laugh violently, crying:

"Ah, my dear friend, have you gone crazy? Where the deuce is your sketch? This isn't a lunar region at all, but a conjuring book of astrology and alchemy that the sorcerers of Albert the Great could make nothing of!"

"What's that?" I said. "My sketch, nevertheless, is not so bad, and you know that for a long time I have attentively studied these very parts of the moon. Tomorrow we will see if the little mountain of Linnæus remains always the same; the sun will be touching it."

“ Well, be kind enough to tell me where the crater of Possidonius is on this paper?”

And he handed me the sheet.

At the first glance at it I felt an unequalled astonishment, so great that I asked myself if I was dreaming. You may imagine my amazement when I tell you that in very truth the paper did not contain my sketch, but a conjuring book done in ink, — a series of fantastic and undecipherable lines.

My first thought was that I had made a mistake in the paper, and had not given the sketch to my colleague. But as I carefully reviewed the circumstances which preceded my handing it to him, I could not entertain this hypothesis. Besides, these undecipherable lines, — I had never seen them before. How came they in my house? In fact, it was the same sheet on which I had drawn my sketch, — a half-sheet of letter paper, marked with my cipher, that I had taken, quite blank, at the moment of sketching.

What explanation could I find for such a phenomenon?

This is the conjuring book that so strangely took the place of my selenographic sketch.

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Evidently there was no way of detecting in these lines the slightest traces of my sketch. It was an inscription, no doubt, but, you will admit, really cabalistic and unintelligible. I was far more surprised than I was willing to seem by this marvellous metamorphosis. I confessed to my friend that I could not comprehend it at all, and allowed him to think that my sketch had been drawn on another piece of paper, and for the moment was missing.

When he had gone, I returned to the paper, and turning it over (which I know not why I had not done

before), I saw my sketch on the other side, not very distinct, indeed, for it was but a slight pencil sketch. But why, in drawing it, did I not see these lines so sharply traced on the other side? Evidently they were not there. I exhausted conjecture, and when bed-time came, I postponed my investigation to the morrow, remembering the old proverb, "night brings counsel."

When I woke, the next morning, I eagerly took the mysterious paper again, and examined it in order to solve the mystery. Another marvel! My selenographic sketch was clearly visible. As to the hieroglyphics, there was not the least trace of them.

"For once," I cried, "that's a pretty successful trick of my familiar spirit! But what can be the reason of all this?"

And I set to work to find out, to frame a thousand conjectures to reach one explanation. At last the thought of the stove and heat reminding me of the properties of sympathetic ink, it suddenly occurred to me that perhaps my hieroglyphics were written with something of that kind. To prove this, I heated my paper, and I had no small pleasure in seeing the mysterious characters come out under the increasing heat. When the writing was clearly visible, I undertook to translate it, to study and try to read it, by using the rules of cryptography.

The first thing that struck me was the signature. This word of five letters made me think of Lumen, and I thought that perhaps my spiritual friend from beyond the Earth was the author of the writing. I instantly

remembered the strange noise I heard twice the previous evening while I was thinking of him, and I decided that this was an idea not unworthy of attention. Besides, I might simply bestow upon it the title of a provisional hypothesis, and see if it would not help me to read the monogram $\delta \Pi \mathcal{U} ? +$.

If, I said, this signature is the name of Lumen, each of these five letters will correspond respectively to the five letters of his name. I supposed then, that

$$\delta = L$$

$$\Pi = U$$

$$\mathcal{U} = M$$

$$? = E$$

$$+ = N$$

and tried to replace each of these signs by the corresponding letter wherever I should find them, and looked to see if this substitution shed a gleam of light into the profound darkness. The first word printed above was then written,

lu.

As the two letters of the second word did not appear in the five of the signature that I had taken for the base of my deciphering operations, I had to pass over them. My substitution plan gave me seven known letters to replace in the third word, and I wrote thus :

$l \triangle n \triangle u e m e n !$

I had scarcely finished writing the word, when it occurred to me that the sign (!) ought to be a *t*, as it ended an adverb. The first word, therefore, must, very probably, be *tu* (thou), and the third ended in *uement*. The construction of these two words taught me two points of great importance in my investigation: first, that the signature was really the name of Lumen; second, that the hieroglyph was arranged for the French language. I resumed my study very hopefully.



The fourth word was not made clear by the substitution of its fourth letter *l*. It was so, unfortunately, with the following words.

The last word of the first phrase was written :

tem  $\sqrt{}$.

I augured that these two last characters must be a *p* and an *s*, and to test my conjecture, I decided to see if the second word of this first phrase favored the hypothesis. Beginning again, therefore, to write this first phrase, I made the following fragments by replacing the unknown characters by points :

Tu .s l.n.ument ...l.....l'esp...e et .u temps.

A logical analysis of this fragmentary sentence showed that the principal word that preceded *temps* (time) must be "space." On this supposition, the sign  became *a*, and the sign  became *c*. Let us

see if this hypothesis will hold, and reunite the sentence with two new substitutions.

Tu as l.n.uement ... l.c. . à l'espace et au temps.

Plainly, that is right.

I spent nearly an hour in turning and turning this sentence without being able to discover the two letters still wanting in the third word, or the six letters wanting in the fourth. Then I undertook to analyze the second sentence of my strange logograph in the same way. The first result of this endeavor was noticing the frequency of the sign \mathfrak{C} . From its position, I conjectured that it must be a vowel, and as I had *u*, *a*, and *e*, I tried *o*, and thus wrote the first word of the second sentence :

l'on.ono.

This hypothesis did not tell me what the word was, though I tried all the consonants in turn for the wanting letter. But as the sign representing the vowel *i* was also wanting, I tried it, and wrote :

l'in.ini.

As soon as I had placed the consonant, I saw with indescribable delight that on filling the gap with the consonant *f*, there resulted

l'infini [infinity].

Which proved, first, that the sign \mathfrak{C} represented the vowel *i*; second, that the sign \mathfrak{Q} was the consonant *f*.

I pursued my interpretation with the increasing pleasure of an algebraist, who rapidly approaches the solution of an equation. The two words following were written with the two signs still uninterpreted :

et l'.te.nit.

“Eternity!” [*l'éternité*] I cried. But instantly I asked myself how it happened that the vowel *e*, of which I knew the representative sign (?) was not designated by that sign, but by the sign \mathfrak{h}_2 . Having found *a*, *i*, and *u*, I tried *o* and *y*, only to learn that these vowels would not do. The word must be “Eternity.” It then occurred to me that the sound of *é* not being the same as that of *e*, the spirit had represented each by a different character instead of using an accent. I went on. The next word was

$\mathfrak{J} ? \Pi^{\circ}_{\circ}$

of which I knew neither the first nor the last letter. I wrote *.eu.*, without discovering the word. I kept on with the rest of the sentence :

..m Rst \mathfrak{G} res \mathfrak{J} i2fciles à a2pr \Delta f \Delta n \mathfrak{J} ir.

“2 f” and “2 p,” I thought, — this must be merely a duplication of consonants. If that is so, the second word of this fragment is

\mathfrak{J} ifficles;

the sign \mathfrak{J} is *d*, and replacing it by the letter that it represents, I can write the sentence again :

deu. m.st.res difficiles à app.f.ndir.

"*Approfondir!*" I cried, the sign \triangle is the vowel *o*. Now I have all the vowels. But stop: between *m* and *s*, in the second word, there must be a vowel. It is neither *a*, nor *e*, nor *i*, nor *o*, nor *u*, but is presented by *R*. But what is *R*? May it not be *y*?

deu. myst.res.

Deux mystères! I've got it! Since *è* has a different sound from *é* or *e*, it will be represented by the sign 8: this cabalistic language has eight vowels. Moreover, the sign $\frac{\infty}{\infty}$ means *x*.

Aided by these discoveries, I attacked the first phrase, trying to make out the words that I did not yet know. Having gone over it again, as I had gone over the second, I found I could spell it almost without hesitation. Then I made an alphabet of all the planetary, zodiacal, astronomical and other signs, and gradually made out the significance of each character. This investigation was not barren of results; for in the end I could read the document that the Spirit had so marvellously composed for me. From that moment it was perfectly intelligible. Here it is:

Tu as longuement réfléchi à l'espace et au temps.

(Thou hast pondered long on space and time.)

L'infini et l'éternité: deux mystères difficiles à approfondir.

(Infinity and eternity: two mysteries hard to fathom.)

Si tu as la volonté d'accroître ton savoir dans cette direction,

(If thou wishest to increase thy knowledge of those themes,)

Prépare-toi à écouter un Esprit qui sait beaucoup.

(Prepare to listen to a Spirit whose knowledge is vast.)

A minuit, dans une lunaison, tu l'entendras comme tu m'as autrefois entendu. Ce ne sera plus moi, car je ne dois plus t'entretenir.

(At midnight, during a lunation, you will hear from him as you formerly heard from me. It will not be I, for I can converse with you no more.)

A month, or exactly twenty-nine days, had passed since this strange episode, when, on just such a night, warm and still, in a strong flood of moonlight, I was alone on the terrace of the Observatory. I stood leaning against the little north structure in which the comet-seeker is stabled; and from this high point of vantage, I gazed upon Paris, all illuminated, and whose dull murmur sounded like the distant plaining of the sea. As of old, from the dark tower of Babel the Chaldeans looked upon bright and busy Babylon, so I looked upon the brilliant evening Paris. The lunar crescent stumped* with a dim radiance the edifices that overtopped the mean level of the gray roofs. The Val-de-Grace, with its noble sculpture, was detached on the ground of the northern sky; the Pantheon reared its lofty dome on high; the tower of

* It is difficult to find an intelligible English equivalent for the French word which I have rendered "stumped." *Estomper* is a technical word in drawing, and means to stump-draw.—[Tr.]

Clovis brought to mind the conferences of Abeillard on Mount St. Genevieve; Saint Sulpice showed its dark nave and its two massive pillars; the little cupola of the Chapel of the Visitation gleamed silvery in the moonlight; the old chestnuts of the Avenue slept in silence, and there was no movement save a gentle and perfumed breeze from south-western fields.

Sir Humphry Davy records that sitting one evening, in the moonlight, on the ruins of the Coliseum at Rome, he was submerged, as it were, in a stream of light, — heard sweet sounds like the tones of a harp, and slept in a kind of ecstasy, during which a Spirit showed to him in succession the several epochs of human history, from the savages of the Stone Age to the brilliant products of modern civilization. While the Spirit exhibited these spectacles, and even the state of life in several worlds of our system, he explained to him in a loud voice the history of terrestrial humanity, and of other humanities of neighboring spheres.* A sensation like that described by the distinguished chemist took possession of my soul, already sunk in a deep revery. But I was only half as fortunate as the illustrious President of the Royal Society, for the direction of my vision was in no degree affected, and I remained awake, seeing no spectacles save those before my natural eyes. My ear alone was affected, and heard a human voice, gentle, deep, and altogether pleasant — a truly sympathetic voice — which said to me what I am going to report. I felt as if a breath touched my forehead;

* The Last Days of a Philosopher, Dialogue I.

instinctively I turned my head to the left, and knew that it was the Spirit whose coming Lumen had announced. Indeed, after reminding me of my own study of the problems of Nature, and of my conversations with Lumen, he said he was going to disclose to me astronomical perspectives whose grandeur had never been comprehended. That he did so, is proved by his hour-long story, which I report with almost perfect accuracy. This is it:

ON TIME AND SPACE.—BY A SPIRIT.

I come from a star with the velocity of a bird of the upper regions,—greater than that of your fastest express-train. I have flown more swiftly than the swallow or the carrier pigeon, than the falcon or the sparrow-hawk, than the condor swooping on its prey. I ploughed through space with a speed far surpassing that of the single locomotive that runs a league per minute,—infinitely more rapid than that of an aeronaut drawn by a cyclone, swallowing eighty metres per second, and devouring the atmosphere of the Atlantic. I have journeyed, without stopping, at the rate of one hundred leagues per hour.

Notwithstanding this incessant velocity, I was *en route* 138 billions, 690 millions, 394 thousand, six hundred centuries. So, as there are 8,766 hours in a year, I have travelled 12 quintillions, 157 quatrillions,

and 600 trillions of leagues since I started. It is easy to verify these figures, for, I may say at once, I come from a universe analogous to yours, from a nebula of the same size as the Milky Way, and which, as it appears to you only under an angle of ten degrees, like the far congeries of stars, is distant 334 times the great diameter of the Milky Way, which is about 36,400 trillions of leagues (seven hundred times the distance from here to Sirius).

I came in a straight line.

These are the bounds of your visible sidereal universe. With the naked eye you cannot see them; but, thanks to your optical inventions, which have increased your visual power a hundredfold, and to your mathematical science, you have been able to push your observations to this point,—to learn that the Earth is a planet revolving in company with many others around one and the same star, which is your sun; to ascertain that every star is a sun shining with its own light; to find by measurements that the star nearest to you is eight trillions of leagues distant; to know that all the stars constitute the same whole, the same nebula; to conclude that around your nebula there is a vast desert; to observe other congeries of stars, far away, populated, like yours; to find that the most distant of these known nebulae lie at the bounds of which I have just spoken, and beyond which creation extends even to infinity, but beyond which your exhausted imagination can carry no conception.

Now I traversed this sidereal universe from one

bound to the other. I came from a nebula in the constellation of Orion, and I am going to one in the constellation of Ophiuchus, just opposite the first, relatively to the place of the Earth. I stopped a minute in your solar system, which is about the middle of my route. This journey gives you the exact dimensions of the universe as they are revealed by the great discoveries of modern astronomy.

Despite your prolonged study of the universe, you have not, probably, an exact idea of its magnitude, and your notions cannot be so positive as his who judges for himself. Stationed in clear space, I judge more accurately, and my measurements will astonish you. I have often noted your unuttered longings for knowledge, and when Lumen once begged me to discourse to you briefly about celestial truths, I heard his request with pleasure, for I am sure that my words received into your mind will not be wasted, but will be understood.

And, in the first place, can you form an idea of infinity? Space, my friend, is without end, without measure or dimensions. Do you fully understand this? Without dimensions: that is, if you went from here toward any apparent point in the heavens, and moved with no matter how great speed, for no matter how long a time, in the direction of that point, at the end of the longest series of centuries that your imagination can compass, you would have made no progress toward your goal, ever retreating farther and farther into infinity. Take, if you choose, another example. Suppose

that the Earth on which you live falls into space during this century, — and that is what happened to the sun, and to the mass of stars of which the sun is a part. Well, suppose it falls in a straight line, or spirally, through as many milliards of years as you choose: after a fearful fall that would plunge it over the ever-yawning precipice with a velocity of a million leagues per day, or greater, if you can imagine it — after falling milliards and milliards of centuries — it would not approach the depths of infinity, and it would be, *quoad* infinity, just as if it had stood still.

In this space — infinite, eternal, uncreated, inevitable — it might be that nothing had existence, that through eternity this infinity was infinitely void. How does it happen that there is “something” in this vast? How does it happen that there are globes luminous and globes dark, and on them solid minerals, vegetation, animals, men, of all species, all forms and all sizes? Surely here is an intrinsic mystery that it would be futile to try to fathom. Whatever may be the reason of the existence of the universe, we can yet do no more than prove that existence, and form an idea of its mode.

The thought most important to you is to imagine this infinite space over the expanse to which I have just directed your mind’s eye, and in this immensity, luminous globes suspended, isolated, unsupported. These are stars or suns, for the two words are synonymous, scattered through infinity at vast intervals.

What sustains these globes in the void? No force is

absolutely necessary for this purpose. Suppose matter to be inert, shorn of all qualities ; these globes, however gross and heavy they might be, besides, would remain motionless in the places where they were put or formed. All properties of matter or influential force wanting, what cause could drag them from their repose or lure them to displacement? None. The verb *tomber* (to fall), as you know, does not express an absolute idea, and can be used only to convey a relative one, because *there is neither high nor low in the universe*. Thus one could not ask what force kept the stars from falling, for this question supposes that there is a lower region in the universe, to which objects abandoned to their own gravity would be drawn. But there is no such arrangement. To you the Earth seems to be the lower region of the universe, because you live on its surface ; but if you remember that it turns on its axis once in twenty-four hours, and that thus all the stars pass successively over your head, you will see how absurd it would be to suppose that this fancied base of the universe makes a diametrical change of place every day. This illusion falls back on the idea that the Earth may be a globe placed in the centre of the universe, — a centre toward which tend all parts of the celestial sphere. But when one knows that the Earth revolves in one year around the sun, one is forced to abandon the second illusion, as well as the first, and to consider all the globes, the Earth included, as isolated and self-suspended without support in immensity.

The inhabitants of every world are borne into space

like an aeronaut in his wherry; as grains of dust adhering to a cannon-ball, they attend it in its flight. The space that we see about us is Heaven.

I have said that if there were no forces in nature, these inert material bodies would necessarily remain immobile, just where the hand of God had hung them. But there *are* such forces, and the most general, the most important of all, which makes the universe move, and is the mechanism of its life, is attraction.

The heavenly bodies are attracted in the direct ratio of their masses, and in the inverse ratio of the square of their distances.

This force given, it follows that all the stars scattered through infinity mutually attract one another. If we suppose that they were created all-formed at the several points of space to which they are distributed, and then abandoned to the force of attraction, all would be set in motion instantaneously, each feeling the attractive influence of its nearest and heaviest neighbor,— this neighbor being, moreover, many thousand millions of leagues distant. Each of the stars, I say, would have undergone a gentle oscillation, and then another, and then another, for each would have felt not the attraction of a single star, but that of two, ten, a hundred, a thousand, the more feeble in proportion to the remoteness of its source.

This first emotion of all the heavenly bodies would have been followed by their universal exodus, each one feeling the summons of the preponderating mass, which would overcome other influences, and moving toward

that mass. The heaviest stars would have drawn the lightest to themselves, and the attraction would have been exerted in the ratio of the square of the distances. On this hypothesis, the general course of all the stars would be toward reunion. They would hurl themselves upon one another, and although it would take two suns moving to meet millions of years to reach contact, yet the ultimate event would be the encounter of all the heavenly bodies rushing madly into mutual collision. Thus, for instance, the moon is attracted by the Earth; if from the height she occupies (96,000 leagues distant) she fell on the Earth, her centre of attraction, she would be four days, nineteen hours, and fifty-five minutes in falling; would move at first but one and two-thirds millimetres in the first second of her fall; would gradually increase her velocity, and would come upon the surface of the globe with a speed one hundred times greater than that of a cannon-ball. The moon weighs 72 sextillions of kilogrammes, and the Earth 5,875. Take another example. The Earth is attracted by the sun; if from its height (37,000,000 leagues) it fell upon the sun, its centre of attraction, it would be sixty-four days and twelve hours in falling, making only three millimetres in the first second of its fall, gradually increasing its velocity, and making its final plunge at the rate of 600,000 metres per second. You can imagine what a crash would follow the collision of this mass weighing 5,875 sextillions of kilogrammes with the sun, which weighs 2 nonillions; 2,000,000,000,000,000,000,000,000,000. Take still

another example. Suppose there were a star near enough to you to have a parallax of one minute (in fact, there is none so near), and that this star had an office as important as your sun's (in fact, many have far more important offices) ; well, if this star and your sun began to-day to approach one another obedient to their mutual attractive influence, they would meet some day midway, that is, after each had traversed 3 trillions, 700 billions of leagues ; but after a journey of more than a million years ! The shock of these colossi would shatter both. The instantaneous arrest of their motion would generate a heat intense enough to vaporize them. Thereafter they would constitute one star, immense and gaseous. Such shocks have already occurred. They have been noticed on your globe, but not understood, by reason of the sudden and great light generated at the point where they happened. Many of the stars called "new," which have shone briefly and disappeared in a few years, or a few months, are the products of two old suns in collision,—united, married, and rejuvenated in a single and new star. But to return to celestial motions.

If attraction were the sole directing force of the universe, and the stars sprang from repose to obey it, the whole universe would tend positively to agglomerate in a single mass, and ultimately would form one solid body. But such is not the end of the creation. All the stars move, not on a right line, but in curved lines. Moreover, those whose courses have been fully measured, follow rigid curves. A few comets constitute the

only exceptions, and these capricious vagabonds fly somewhat in the manner of bats, which seem to dive at the turrets, and suddenly turn back, describing a parabola, to vanish in an unexpected direction. In the same way the long-haired comets flee from system to system. But the solid globes that are the bases of the systems, move in rigid curves, the satellites around the planets, the planets around the suns, and these latter around greater centres of gravity.

These rigid curves give rise to a second force, opposed to attraction,—centrifugal force, which, as its name indicates, tends to drive the stars from the centres around which they revolve. As the stone in the sling tends to escape, so tend the planets to escape from the solar force, and the satellites from planetary dominion. If this centrifugal force had no rival, or if it were preponderant to attraction, there would result a general tendency of the universe directly opposite to that which we were speaking of just now; all the heavenly bodies would tend to fly their respective centres, and instead of the convergence, which, in our first hypothesis, would have concentrated all bodies in a single mass, there would be a divergence driving all the stars outward, and pushing them like the waves of the shore to be wrecked on the banks of infinity. But, as infinity has no bounds, this diversion from the centre and desertion of first positions could continue indefinitely, make a void, in a manner, in the centre of the universe, and drive all the stars toward an external circumference never attained, ever retreating.

But centrifugal force does not exclusively direct, any more than attraction exclusively possesses, the stars. These two opposing forces are *equal*. By the attraction of the sun, the Earth is drawn toward it with the intensity of three millimetres in the first second of tractation. By the repulsion generated by its course it is driven off with exactly the same intensity of three millimetres in the first second of the movement in the contrary direction. There results from this double pressure a perfect equilibrium, owing to which the planets can neither approach nor withdraw from the sun. This equilibrium it is that sustains the Earth and all the worlds in space. Thus, my friend, you now fully understand, I hope, this ideal system. Neither the Earth nor any one of the milliards of inhabited worlds is held up by any material force. These bodies rest, in a certain sense, *on an idea*. And they are more solid and firm on this invisible force than they could be on the strongest props of iron or brass, by means of which the ancients thought it necessary to account for the stability of the world.

Now this magical equilibrium can exist only on the condition of perpetual and universal motion. For this reason, not one atom is at rest in the world. All is in motion, incessant motion. The Earth turns on its axis in twenty-four hours. The moon turns around it in twenty-nine days. The Earth at the same time runs through an orbit, of which the sun is the centre, in three hundred and sixty-five days. Every planet also describes around the sun an orbit proportioned to its

distance ; that of the nearest, Mercury, being accomplished in eighty-eight days, and that of the farthest, Neptune, in one hundred and sixty-five days. Now the sun, which seems to be relatively motionless at the centre of the planetary system, turns on his axis in twenty-five and one half days, from West to East, in the same direction in which all the planets revolve. Moreover, he changes his places and moves forward in space, drawing after him the whole planetary system. In its annual journey around the sun, the Earth travels at the rate of 644,000 leagues per day, and each planet is borne onward in its course by an analogous movement according to its distance and the road it has to pass over in making its revolution. The velocity with which the sun and his retinue move in space is sixty million leagues per year. Thus he has run ever since he existed, really tending toward the stars of the constellation of Hercules. This velocity is considerable, estimated by your measures ; but space is so vast that even supposing that he goes in a straight line toward Hercules, at the end of a million years he would not have reached one of the stars of that constellation, for they soar more than 60,000,000,000 leagues away.

Every star, every sun of space, attended by its system of planets, thus moves. And by this rapid movement of all the stars of infinity they are kept in equilibrium, far from one another, in the imperishable and labyrinthine network of universal attraction. By this movement they live. Our sun is one of the stars that move with the least velocity. The movement of Arc-

turnus is about 1,800,000 leagues per day. That of the star numbered 1830 in Groombridge's catalogue is 2,822,000 leagues per day. And so with other suns. Yet these stars are apparently fixed on the ground of the silent night, and in the years and centuries since they were first observed, they seem never to have changed place. The Earth seems to be motionless under your feet; the sun to rest at the centre of the planetary system. Why is this convincing appearance of rest and immobility? Because these immense movements take place in so vast a field, and at such distances, as to be imperceptible. From the distance of the star that is nearest to you, the extent of the annual movement of the Earth, the circle of its orbit, would be hidden by a thread a millimetre in size placed one hundred and twenty-five metres from the eye of the observer.

The seventy-five million suns which constitute our congeries of stars, all sustain various systems, carrying undiscovered humanities into the wastes of space, on the surface of their worlds. The greatest diversity exists among all these offspring of the heavens. On the star you live in, the sun's light is white, its mean annual heat does not exceed thirty degrees centigrade, the year lasts 365 days, and the day 24 hours; man has an average weight of 60 kilogrammes, a height of $5\frac{3}{4}$ feet, and vital heat of $36\frac{1}{2}$ degrees; his average length of life is 39 years; and he reproduces himself at the rate of three generations in a century. In another world the sunlight is blue, and there are no

other colors ; its mean heat is 50 degrees below zero ; the year is about 60,000 days long, and the day about seven hours ; man weighs 1,500 kilogrammes, is 50 metres tall, with blood colder than ice in his veins, and his mean longevity is four hundred years. In still another world, on the other hand, there are three suns, two red and one violet, twelve moons of different colors ; the temperature of the blood is about 300 degrees, and man resembles a sphere of vapors, flying and swimming in the atmosphere, like soap-bubbles. Matter, weight, density, heat, light, years, seasons, measure, etc., — all these elements are in infinite variety throughout the inexpressible diversity of the systems of worlds.

The stars are not of equal dimensions, or equal brilliancy, and the difference in their apparent magnitude is not wholly due to the difference of their distances. The most brilliant stars — those you call stars of the first magnitude — are not the nearest, and the smallest are not the farthest. There is as great variety in the products of the heavens as in those of the Earth, — indeed, even greater. Many stars far surpass your sun in size and luminousness ; others are inferior to it. The annual movement of the Earth carries you over an orbit 74,000,000 leagues in diameter, and produces a slight apparent movement in the nearest stars ; as when you are travelling, the trees at the roadside seem to move in a direction opposite to your own ; so the nearest stars annually describe, relatively to those which remain fixed, a little ellipse corresponding to the perspective of the terrestrial orbit. The nearest — that

of Centaur — describes an ellipse scarcely as long as one nine-hundredth part of the apparent diameter of the moon. It is exceedingly small. But this distance (the shortest) is yet so great that the orbit of Neptune, described with a radius 300 times greater than that of the Earth's orbit, can scarcely be compared to it. If we imagine a sun big enough to fill this whole orbit, it would nevertheless appear, seen from this star, under a disc only nine times smaller than that which it now displays. If the sun, as it is now, were transported as far as α of Centaur, its brilliancy would be represented by the fraction $\frac{1}{52,900,000,000}$, compared with its actual brilliancy. But the light that you receive from α of Centaur is, compared with that of the sun, as $\frac{1}{16,980,000,000}$. It follows that this star emits about three times more light than your sun. Its volume is in the same proportion, and its diameter is to that of your sun as 17 : 10.

The two brightest stars in your heavens are Canopus and Sirius. The first is three times brighter than α of Centaur; and as the annual translation of the terrestrial point of observation effects not the smallest change in the position of this star, it follows that it is incomparably farther from you, and incomparably more luminous and voluminous. Sirius is more than four times as bright as α of Centaur, and shows an annual change of position which has enabled you to determine its distance. Calculating this distance, we find that its intrinsic light is 64 times greater than that of the sun of Centaur, and 192 times greater than your sun's.

Its diameter is 14 times greater than your sun's, and its volume 2,688 times, though your sun's is 1,380 times greater than the Earth's.

On the other hand, the sixty-first of the Swan, more distant than Sirius, and nearer than α of Centaur, is a double star, of which each half sends you but an hundredth part of the light of this last star. This latter, at the same distance, would appear nine times less brilliant than it does, and would seem eleven times brighter than either half of the double star. The diameter of each of them is less than a third of that of α of Centaur, and its volume is not one-thirtieth. The sum of their volumes is only a third of your sun's, while their mass is nearly equal to its mass.

From these examples, which I commend to your attention, you can judge how great a diversity exists among the suns. The volume of Sirius is 2,688 times as great as your sun's, which is six times as great as that of each of the twin suns of the Swan, which gives the Sirius-sun a volume 16,000 times as great as that of the Swan-suns. There are really greater differences between the suns of your sidereal universe than between the planets of your solar system, though in it you have a globe, like Jupiter, 1,400 times as large as the Earth, and little telescopic planets, like Sylvia and Camilla, scarcely as large as one of the Departments of France.

Besides, the quantity of light is not always an indication of volume, for there are stars of all degrees of brilliancy, of all chemical and physical states, and all

densities. Some are huge and light ; others are small and heavy. These, of enormous size, are almost dim, and even quite dark, emitting only heat. Those of less size shine with a dazzling lustre which penetrates the illimitable fields of space. These different chemical, calorific, and electric states produce the great diversity of colors among the suns, from gold and orange to emerald and sapphire, and every flower blooms in the heavenly parterre, from the splendid rose to the modest violet.

A journey through these vast regions changes all perspectives and all ideas. I passed, on my way, three stellar congeries which sailed in the seas of the heavens like immense archipelagos. The masses of stars, the universes, are composed of many millions of suns and planetary systems, and surrounded by unfathomable deserts. Thus, the first of these sidereal universes that I encountered on this journey was two quintillions of leagues from my starting point ; the second, five, and the third, nine quintillions. Thirty-six or thirty-seven quatrillions of leagues from here, I began to see the first houses of your village, or more accurately speaking, the outskirts of your stellar city ; and from that time to the present, I have traversed not more than half of your universe, though I entered it 415,000,000 centuries ago, and moved at the rate of one hundred leagues per hour. I met, on my way, in turn, double, triple and multiple suns, revolving in a circle with their systems around those of the others ; solitary suns fleeing with inconceivable velocity, with

the worlds of their kingdoms in tow ; colored suns shedding on their planets colors in strange blending ; systems wholly gaseous, and formed of mere spheres of vapor ; stars of azote, and comets of carbonic acid.

The arrangement of the stars in space varies according to their place. Lines, straight or broken, various forms ; the rectangles, squares, arcs, coronas, which they seem to form from a certain point of view, are undiscoverable from other points. Coming into your solar system, I noticed the apparent arrangement of the celestial spheres, — your constellations. They are the same, whether seen from the moon or the Earth, from Venus or Mars, and even from Neptune, because the celestial perspectives suffer no change by a mere displacement of a few hundred millions of leagues. But counting by trillions, and still more by hundreds of trillions of leagues, the difference is apparent, and the constellations undergo changes of form, especially as one draws near to or enters them.

Here the Spirit paused. After a long silence he resumed in these words :

We now come to your own solar system. The foregoing passages — if you have fully apprehended their simple eloquence — have opened to your mind such immensities that you can easily figure to yourself the vast extent of the sun's domain. Heretofore, notwithstanding your studies, you have not correctly imagined it.

I will take to illustrate that extent, the orbit of the great comet that visited the Earth in 1680. This comet

withdraws to a distance twenty-eight times as great as that of Neptune, which, as you know, revolves in an orbit whose radius is thirty times larger than that of the Earth's orbit. The distance of α of Centaur is 270 times greater than the aphelic radius of this comet, that you may regard as representing at the minimum the radius of the solar system. You see, by taking vast distances for units of comparison, one can measure space without employing figures, which slip out of the mind.

In coming, — not from the star, for I did not come from that quarter, but from a point equi-distant with the nearest star, I was nine millions, eight hundred thousand years. In coming from the aphelion of that great comet, I was thirty-six thousand, three hundred years. She goes, in fact, 32 milliards of leagues from the sun, and, even at this distance, the latter can recall from the depths this feeble cometary nebulousity, so light, notwithstanding its extent, so diffuse and so insignificant compared with itself, and which, in such a waste, still trembles when at the end of her course the great sun gives the order to return, which she can do, despite the willing obedience, despite the increasing velocity with which she rushes toward the flaming sun, who summons her, which she can do, I say, in no less time than forty-four centuries.

In the nine millions seven hundred and sixty-four years that I have spent in traversing the expanse which surrounds the sun's domain, and isolates it, in a sense, from that of the circumscription of the Centaur

— a like desert surrounds each system, and makes each sun king in his own country—I have encountered no principal heavenly body, whose attraction could influence the sun's upon the stars that it governs; only ruins of worlds destroyed, which fell into space very slowly, and seemed, indeed, motionless, for no star in these intermediary spaces possesses any considerable attraction. At the aphelic distance of the comet of 1680, the solar attraction is only 0,000,000,008,333 metres, and the comet is attracted by no force that cannot make her move 41600 thousandths of millimetres in the first second of fall! Thus she seems to be an inert body sustained in the dark void like an airy phantom. All the comets that wander into these regions form but a slow procession of ghostly shades. At a point one hundred times farther than the aphelic distance of the same comet, the attraction of the sun is only 0,000,000,000,000,8333 metres. Thus, between the two attractive spheres of the sun and α of Centaur, the directing force of celestial movements has, so to speak, become null, and a body placed at that distance would remain hanging motionless for thousands of years. One would think one was approaching nothingness or chaos; but these solitudes having been traversed, one emerges into new systems.

In fact, when I had crossed the orbits of many planets behind Neptune, of which the last, Hyperion, lies at 48 times the distance of the Earth's radius, and makes one revolution in 335 years, I came to Neptune,

1147 millions of leagues away. That was thirteen centuries ago.

The Spirit was silent for a few minutes, like one who has finished his discourse upon a subject. And, indeed, he had, by means of his journey, enabled me to see in review the whole constitution of the heavens, from the limits of the stellar mass to which our sun belongs, and from the distant universes alien to our own, even to our own planetary system into which he came in his narrative. I had listened attentively, and deliberately pondered the grand stages by which his synthesis descended from the heights of infinity to the part of the heavens that we inhabit, and when he told me that he came to Neptune, the farthest planet known to us, thirteen centuries ago, I thought that this event must be dated in the sixth century of our calendar. So I said to him :

“We are in the year 1872 of the Christian Era. You, therefore, visited Neptune during the reigns of Chilperic and Fredegonde. Since that day you have travelled at the rate of one hundred leagues an hour, and have only this year reached the Earth !”

In space, answered the Spirit, we do not reckon time, as I have already explained to you. The history of the terrestrial planet and its political dynasties is of the merest insignificance. The Christian Era itself, which, it would seem, from several points of view, ought to have an existence in heaven as well as in the evangelized nations, is not known in other worlds. But,

reckoning by terrestrial translations, it is really 1,308 years since I was in Neptune.

"So," I replied, to confirm this measurement of space by time, "if a man could start from the Earth to-day, and proceed to the known bounds of planetary stars—the Neptunian world—it would take him, travelling at the rate of one hundred leagues an hour, 1,308 years to reach those frontiers,—that is, till the year 3180?"

You are right. That is the measure of the demi-diameter of the farthest planetary orbit that is known. Yet these 1,308 terrestrial years are only eight Neptunian years. The calendar is materially different in different planets. Yet one year of Neptune is no longer for its inhabitants than is one of the Earth's years to you. Absolutely considered, to a non-incarnated mind, there the durations are *nothing*, and are equal in their nothingness. Time is formed by the periodic movements of material bodies, and these bodies, which change with it, are alone subject to it. Forces, real entities independent of matter, imponderable dynamic potencies, which sustain weights, are almost independent of time, for they transmit themselves with a rapidity which hardly falls short of instantaneity. The soul of man, though wrapped in a fluid matter, that here below forms a necessary intermediary between it and the body, and which, surviving the death of the earthly body, remains attached to the spiritual monad, the soul, I say, can go from one point in space to another

with a speed greater than that of light and electricity, and, so to speak, instantaneous.

“But, O Spirit, if the soul can travel in space with such velocity, why were you so many centuries in coming from the bounds of the astronomic universe?”

I could have made the journey in a few days, answered the Spirit, amiably. But, I repeat, days and ages are equal durations to a spirit, and I was not a *longer time* in making my journey than as if I had come instantaneously.

Preëxisting life, the soul has no age when it is incarnated. It has no age when, life ceasing, it frees itself from its earthly vestment. It is no older when it is incarnated anew, on the earth or on another planet. It grows not old in eternity. Flowing over it, the ages leave less trace than do the rains of heaven on the shoulders of a marble statue.

It is not so with animated bodies, combinations of atoms, aggregations of molecules, material worlds, and all the stars that constitute the physical universe. Time is for these worlds and by them. The suns know no night, and enjoying perpetual day, nearly realize the conditions of eternity. But they have translations, modifications of temperature, and variations which give them a measure of time, slow, it is true, but real. They do not endure forever, but grow old and perish. The planetary worlds have days and nights, months, seasons, years. The movements that possess them form their differing calendars, giving to the Earth years of 365 days, by which all lives begun on that

planet are measured ; to Jupiter, years of 10,409 days, to Saturn, years of 25,421 days, and to the sun and the planetary system a revolution of more than 200,000 of your years. With time, stars change their places and the constellations their forms, systems decay, the planets crumble into dust, and suns go out in darkness. Thus there is time, that is, movement, for all material objects.

Absolutely it does not exist, for in clear space among the heavenly bodies there is no time, no measure. The Spirit is no longer dependent on time ; he can measure it only by means of the planetary movements, — century clocks of the heavens.

So the 138 billions of centuries that I have spent in my sidereal journey do not count for me as they count for material worlds, and I am no older than when I set out. This is the important principle to which I beg your attention. The material universe is the changeable residence of spirits who do not grow old.

In the life of a Spirit — or, more accurately, in a phase of the eternal life of a Spirit — a world as important as the whole Earth, or even as Saturn or Jupiter, may be born, live and die ; its whole career be achieved, its humanity manifested, it may become civilized and improved, reach its apogee, and vanish, while every spirit that inhabited it shall remain unimpaired, often reincarnated on the same planet, and passing from one planet to another, in space, never growing old.

There are two quite distinct worlds in creation : the

spiritual world, which knows no material conditions, like time, space, volume, weight, density, and color, and in which are the principles of justice, truth, the good and the beautiful, co-eternal with God; and the material world, for which there is neither good nor bad, neither justice nor injustice, neither beauty nor deformity, but which rests on the principles of material reality, — time, space, dimensions, weight, etc.

“Master,” I said, when I heard this classification, “if the elements of the physical world are absolutely unknown to the world of spirits, how can these spirits know the universe, see the worlds, and journey from one to another? How, during its incarnation, can the soul even perceive the external universe?”

By intermediary principles, answered my unseen collocator. These are *forces*, — attraction, light, heat, electricity.

The soul, even while it is incarnated, cannot act directly upon matter. If your soul can occupy itself with astronomy, with physics, chemistry, with the exact sciences, in a word, it does this, not intuitively, or by its own power, but through intermediary agents. Your body, on the other hand, cannot act without these forces. They are the *substratum* of the universe, exist everywhere in infinity, and occupy all space, in which atoms only float. The constituent atoms of a bit of iron, marble or earth, of a molecule of water or air, of oxygen or hydrogen, are not welded solidly together, as they seem to be, but are isolated, separated, as are the planets and the worlds of the universe from one

another. There is nothing absolutely solid, but there are interstices, spaces relatively vast, between the constituent elements of all bodies, animate and inanimate, so that the calorific force draws together or scatters them, expands or contracts their volumes, produces apparent solids, liquids or gases, three different states of the same substances, and which are due merely to the calorific force. An eye that should see the atomic structure of an object would no longer see the object itself,—the vision would pass through it. Thus of your universe you see only the atoms,—its stars; you must look farther to recognize the clearly-defined form of a universe,—of a congeries of stars. Well, when you receive a ray of light, for instance, this ray crosses the orbit of your eyes and the very structure of the organ, to reach a nerve, which would feel no sensation if, life being destroyed, your mind were not there to interpret the shock and give a meaning to the luminous vibrations transmitted by the optic nerve. Between the object viewed and your mind there is an intermediary agent, the force, which is the light, without which your mind could not be put in communication with the object.

But the organism that you have is not necessary for this work. Light, like heat and electricity, and other forces that you know of, is transmitted by motion, by the vibrations or undulations that your mind could receive without any of the senses with which you are endowed. The eye is not indispensable for seeing. Another organ could take its place,—one unlike it,

which would, for instance, be sensible to gentle waves, and would see heat, or to rapid waves, and would see chemical action, and would give the mind an idea more or less expanded of the things you are ignorant of, because you have not senses wherewith to understand them. You live in the midst of an invisible world, in which spirits, furnished with other senses than yours, perceive innumerable realities, of which you know nothing.

You should, then, see in the universe, first, the element of *matter* subject to finite conditions of space, subdivided into very little atoms, unchangeable in size and mass ; secondly, the *dynamic element*, which, on the contrary, is not subject to finite conditions ; and thirdly, the *animic element*, the spirit, wholly individualized in space, and, unlike matter, incompatible with any idea of form and fixed limitations.

"Unknown Spirit, who speakest to me," I said, "whoever thou mayest be, I have listened to thee reverently, and I am happy to add that I comprehend this synthesis. I see the stars and the atoms, the forces that uphold and control ponderable bodies, the spirits that people the worlds or dwell in space ; to me the universe is bathed in a new and clear radiance which reveals its grandeur and beauty. But thou hast not shown me God ?"

Because even spirits cannot comprehend the infinite Being, answered the Voice. You have been taught, to this day, to worship a God created in man's image, or boldly to deny the existence of an Author of nature,

because he is incomprehensible. Neither the dogmas of official theologies nor the negations of infidelity are true.

God is no more in any part of heaven than on Earth, — or more accurately, He is nowhere more visible than here. There is not anywhere in infinity a certain place with pavements of pearl, on which stands the throne of the Most High. The Empyrean of the middle ages no more exists than does the Olympus of the Greeks. The Paradise of Mahomet never shone save in the glowing imaginations of the prophet's disciples. The seven heavens of Buddha are no more real than they are in the grotesque pictures of China and Japan that figure them to you. To see God face to face is an expression purely symbolic. The eyes of the most glorified, most angelic body, could not see or admire anywhere that invisible Person. Heaven has no existence. Astronomical space is infinite. God is a pure spirit, or rather, *the* pure spirit, conscious of itself, and of every infinitesimal part of the universe; personal, but without form; infinite and eternal, that is, without extent or duration; as really present here in the heart of Paris, where I am speaking to you, as in the brightest stars; as active in the operations of terrestrial Nature as in the sublime manifestations of the higher spiritual spheres.

The infinite Being, — Cause of causes, Principle of all that is, virtue and support of the universe, absolute, eternal, — is, moreover wholly incomprehensible by you, and me, and all creatures. His existence is indis-

putable, for without it it would be impossible to explain the existence of intelligence in the creation, of mathematics (which man did not invent, but discovered), and of intellectual and moral truths. But the Author and Supreme Judge of all things is above our conception. Still we can understand that for Him there is neither time nor space, that he sees all things at once, and astronomy has also taught you that the light proceeding from all the suns and planets carries their past history into space, so that, supposing one's self placed at a point whither comes to-day the luminous ray reflected by the Earth an hundred years ago, one would review the Earth of that time and its people; and so for the whole past of the Earth, that one could see by withdrawing to a sufficient distance, and so for the history of all the worlds, which thus survives perpetual in infinity,—in God. Even now we can conceive also that the future as well as the past may be present to Him, for the events that are to happen are comprised in the actual state of the universe as the past is in its result. But efforts to comprehend the intrinsic nature and mode of action of the infinite Being would be utterly vain labor.

And now, my son, your mind has received, has felt, the idea of the infinity of space. Has it also clearly understood that of infinity of duration? Do you adequately conceive the grandeur of the idea and the fact represented by this word *Eternity*?

"It seems to me," I answered, "more difficult to imagine endless duration than boundless space. I can

easily suppose myself arrived at a feigned barrier in immensity, to see space beyond this barrier, to imagine a farther limit, to attain that, still to see space beyond, and so on forever, never able to reach in any direction bounds that have no existence. But I confess that indefinite time, or better, limitless eternity, terrifies rather than amazes me, so that my mind is hardly strong enough to look such a subject in the face."

Your idea of a barrier ever retreating into space, answered the Spirit, is applicable to the notion of eternity. However long may be the periods you imagined, you can suppose yourself to have achieved them, and determine that duration cannot be arrested just for this lapse of time, and that time will continue still to run. The feigned limit being carried farther, there will be more time beyond, and so on, endlessly. But note that these are only two comparisons designed to render these notions more clear, while, in fact, infinity, like eternity, is immeasurable.

In an eternity without measure, without beginning, and without end, the material universe produces measure and time by its movements. But these measures themselves are by no means absolute. If the Earth turned twice, or a hundred times more slowly, the days and years would be twice or a hundred times as long as they are: but they would be *the same* to you. If the Earth became a hundred, a thousand times smaller than it is, and your monuments, your stature, a hundred, a thousand times smaller than they are, all would remain *the same* to you; the measure would always be

the ten-millionth part of the quarter of the terrestrial meridian, you would see objects under the same angle, etc. All your ideas, which have heretofore seemed absolute to you, are purely relative to your perishable planet.

In motionless Eternity Spirits endure, material things pass away.

But behold the first glimmer of the coming dawn. I will no longer delay my flight and my heavenly journey. I told you that I cross the universe from side to side, and after my pause here, I continue my course away from Orion, towards Ophiuchus. I shall come back here and then proceed to my starting-point.

When I shall return into this quarter of the heavens where the solar system now moves, when my sidereal passage has brought me to this harbor where I have stopped a minute to-day, that harbor will no longer be in existence. I take my celestial way to the very bounds of your visible universe, and the way thither is as long as that which brought me hither; that is, I shall not reach the end of my journey for about 138 billions of centuries, flying with the same unvarying speed of one hundred leagues per hour. I intend to remain below there a hundred centuries to superintend the establishment of a new humanity which will occupy honorably, I hope, that region of space. Then I shall return in a straight line, not only hither, but to the point from which I set out.

Now my return here will be in 277 billions, 380

millions, 789,000, 300 centuries. At that time the Earth will no longer exist.

Yes, this beautiful planet, to-day so full of life and activity, so noisy and so rich — on whose surface generations follow each other so rapidly — this planet will be dead — quite dead — yes, destroyed ! As surely as she hides to-day in her bosom the elements and *data* of her beginning, so surely does she hold within herself the germs of her own decay and death. And not only she, but her companions, also ; her young sister Venus, so closely resembling her, and of a life just now so like her own ; Mercury, ardent and swift ; Mars, whose geography is so strange ; Jupiter, noble and majestic in his course ; Saturn, girt with a triple ring, and surrounded by eight satellites ; Uranus, slow and venerable ; Neptune, whose years are centuries ; all these worlds will have ceased to live. What do I say ? They will have lost all heat ; water, air, liquids, gas, cohesion and affinity, principles of life, — all will have passed away. Silent deserts rolling in gloomy space, they will display nothing but ice and rocks naked to the feeble rays of the sun. Meteors, winds and rains will have dragged the mountains down to the plains, heaved up the bed of the seas, and gradually occupied the surface of the ocean, which already fills three-quarters of the globe, and at last will cover the whole. The spots on the sun will have increased in number, and its huge body will have lost its heat by long radiation into space. At first these spots will be seen to stretch, like two dark zones, from each side of his equator, and

meteorologists will have noticed a perceptible diminution of his heat and light. In millions of heaped-up centuries, his frigeration will become so great that planetary organisms will be imperilled, and will give place to new creatures fitted to live in the cold. But an age will come when the sun, first a dull red, then dim, will cease to be the centre of the family which so long has drained his magnetism and his vitality, and will emit only a dull and doleful glimmer. The days will become nights, and there will be no more spring or summer. The worlds, heavy and dark, will revolve like dusky balls around another dusky ball. Universal night will brood over this system. The Earth, the moon, and the planets, will bear into immensity the fossil tombs of their last inhabitants. In the same time, many other suns of the universe, that now shine like twinkling stars, will be extinguished, like yours, while new stars will be lighted. Moreover, those stars that remain will have changed their places. The constellations will be scattered. The septette of the Great Bear, though not one of them shall be put out, will no longer form a chariot, the car of the North will be dismantled, and of their own motion they will be sundered from one another, and go to constitute, first, a trapèze, then a huge triangle, then a shapeless broken line. Orion, the splendid constellation of the South, will have undergone the secular dismemberment of time, the Three Kings will be separated, Rigel will be extinguished, Aldebaran will have fled far from the Pleiades, Sirius will have lost his sceptre, and the stars of Her-

cules will have become stars of the first magnitude. The Heavens will not be recognizable, and the Earth, decaying, dried up, disintegrated, will have broken into fragments, which scattered along its orbit, will still revolve around the lifeless sun. Dwarf skeletons turning around a giant skeleton, aerolites bearing into night the last scraps of a once peopled land, they will be snatched up on the way by a hyperbolic comet, which, dragging some of them along its course, will sow them in another system, on some unknown planet, whose inhabitants, picking them up for their museums, will analyze them, without discovering the history of the Earth whence they came, like aerolites that you preserve without knowing the secret of their origin. That's what will have happened to the Earth and its people, when I come back from my celestial mission. The bodies will have returned to the dust.

When the Spirit spoke in this fashion, I felt a shiver thrill my whole being at the profundity of these revelations to which I had listened with the keenest attention. I saw the future — the stars in new places — the constellations sundered, the planetary system destroyed, *the sun extinguished*, the Earth — where we are quietly living to-day — *the Earth itself annihilated*, and nothing in the region of space that it now fills ; I felt that this perspective was true, and considering that the Spirit spoke of these strange days without seeming to be conscious of time or to grow old, I thought of what will become in the Eternity before us, of each of our souls, oh, my readers ! and what will become of me

in this doom ; and as if stricken by a thunderbolt, I uttered this selfish cry, which simply betrayed the keenness of my sudden solicitude, — a cry that each one of you, no doubt, would have uttered as I did —

“ *And I!* ”

And you ! Well, you are like me ; you are immortal, indestructible.

“ *Indestructible!* ” I cried, apprehending for the first time the strange beneficence of this attribute. “ But where shall I be in a hundred years from now, for instance ? ”

In space : no one can go out of it : it is infinity. You will probably still be in your planetary system.

“ And in a thousand years ? ”

You will still live.

“ And in a hundred thousand years ? ”

You will be forever. No doubt you will travel. For an astronomer, that is not a bad employment.

“ You jest about things that are familiar to you, oh Spirit ! But I — I confess it — I am afraid. And where shall I be in a million years ? ” I added, trembling.

You will still exist in infinite space ; and so in ten millions, and in a hundred million years. And at the end of a hundred million years, you will be no older than you are to-day. You will begin a hundred other millions of years, and so on.

“ Unable to die ? ” I cried, terrified by the calm positiveness with which the Spirit stated these appalling truths.

Immortal, indestructible, through all eternity. Do you justly estimate this divine boon? Think, then, that millions of milliards of years are *nothing* in eternity, and that after their lapse one begins again as if they had never been lived . . . and that your life is henceforth *without a possible end*.

* * * * *

"Life eternal! without . . . a . . . possible . . . end." I repeated the words, trying to comprehend their full meaning, and feeling my brain dissolve in my head. Ah! . . . and I fell as a dead man falls!

